



SEQUENCE LISTING

B¹
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<120> TRANSFERRIN RECEPTOR GENES

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<140> 10/043,344

<141> 2002-01-14

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<151> 1996-05-17

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Met Lys Ser Val Pro															
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1260 1265 1270 1275

aaa aat ttc tct tgg aat act ggt att gtc ata aaa cca acg gaa tgg 4062
Lys Asn Phe Ser Trp Asn Thr Gly Ile Val Ile Lys Pro Thr Glu Trp
1280 1285 1290

ctt gat ctt tct tat cgc ctt tct act gga ttt aga aat cct agt ttt 4110
Leu Asp Leu Ser Tyr Arg Leu Ser Thr Gly Phe Arg Asn Pro Ser Phe
1295 1300 1305

gct gaa atg tat ggt tgg cgg tat ggt ggc aat aat agc gag gtt tat 4158
Ala Glu Met Tyr Gly Trp Arg Tyr Gly Gly Asn Asn Ser Glu Val Tyr
1310 1315 1320

gta ggt aaa ttt aag cct gaa aca tct cgt aac caa gag ttt ggt ctc 4206
Val Gly Lys Phe Lys Pro Glu Thr Ser Arg Asn Gln Glu Phe Gly Leu
1325 1330 1335

gct cta aaa ggg gat ttt ggt aat att gag atc agt cat ttt agt aat 4254
Ala Leu Lys Gly Asp Phe Gly Asn Ile Glu Ile Ser His Phe Ser Asn
1340 1345 1350 1355

gct tat cga aat ctt atc gcc ttt gct gaa gaa ctt aat aaa aat gga 4302
Ala Tyr Arg Asn Leu Ile Ala Phe Ala Glu Glu Leu Asn Lys Asn Gly
1360 1365 1370

act gga aag gcc aat tat gga tat cat aat gca caa aat gca aaa tta 4350
Thr Gly Lys Ala Asn Tyr Gly Tyr His Asn Ala Gln Asn Ala Lys Leu
1375 1380 1385

gtt ggc gta aat ata act gcg caa tta gat ttt aat ggt tta tgg aaa 4398
Val Gly Val Asn Ile Thr Ala Gln Leu Asp Phe Asn Gly Leu Trp Lys

1390 1395 1400

cgt att ccc tac ggt tgg tat gca aca ttt gct tat aac cga gta aaa 4446
 Arg Ile Pro Tyr Gly Trp Tyr Ala Thr Phe Ala Tyr Asn Arg Val Lys
 1405 1410 1415

gtt aaa gat caa aaa atc aat gct ggt ttg gcc tcc gta agc agt tat 4494
 Val Lys Asp Gln Lys Ile Asn Ala Gly Leu Ala Ser Val Ser Ser Tyr
 1420 1425 1430 1435

tta ttt gat gcc att cag ccc agc cgt tat atc att ggt tta ggc tat 4542
 Leu Phe Asp Ala Ile Gln Pro Ser Arg Tyr Ile Ile Gly Leu Gly Tyr
 1440 1445 1450

gat cat cca agt aat act tgg gga att aat aca atg ttt act caa tca 4590
 Asp His Pro Ser Asn Thr Trp Gly Ile Asn Thr Met Phe Thr Gln Ser
 1455 1460 1465

aaa gca aaa tct caa aat gaa ttg cta gga aaa cgt gca ttg ggt aac 4638
 Lys Ala Lys Ser Gln Asn Glu Leu Leu Gly Lys Arg Ala Leu Gly Asn
 1470 1475 1480

aat tca agg gat gta aaa tca aca aga aaa ctt act cgg gca tgg cat 4686
 Asn Ser Arg Asp Val Lys Ser Thr Arg Lys Leu Thr Arg Ala Trp His
 1485 1490 1495

atc tta gat gta tcg ggt tat tac atg gcg aat aaa aat att atg ctt 4734
 Ile Leu Asp Val Ser Gly Tyr Tyr Met Ala Asn Lys Asn Ile Met Leu
 1500 1505 1510 1515

cga tta ggg ata tat aat tta ttc aac tat cgc tat gtt act tgg gaa 4782
 Arg Leu Gly Ile Tyr Asn Leu Phe Asn Tyr Arg Tyr Val Thr Trp Glu
 1520 1525 1530

gcg gtg cgt caa aca gca caa ggt gcg gtc aat caa cat caa aat gtt 4830
 Ala Val Arg Gln Thr Ala Gln Gly Ala Val Asn Gln His Gln Asn Val
 1535 1540 1545

ggt agc tat act cgc tac gca gca tca gga cga aac tat acc tta aca 4878
 Gly Ser Tyr Thr Arg Tyr Ala Ala Ser Gly Arg Asn Tyr Thr Leu Thr
 1550 1555 1560

tta gaa atg aaa ttctaaatta aaatgcgccga gatggactag acatgctata 4930
 Leu Glu Met Lys
 1565

tctatacctt actggcgcat ctttttctgt tctataatct ggttaagtga aaaaccaaac 4990

ttggatTTTT tagaagatct ttccacgcat ttattgtaaa atctccgaca atttttaccg 5050

cacttttctc tattacaaaa acaataagga tccttttgtg aatctctca 5099

<210> 5

<211> 913

<212> PRT

<213> Haemophilus influenzae

<400> 5

Met Thr Lys Lys Pro Tyr Phe Arg Leu Ser Ile Ile Ser Cys Leu Leu
1 5 10 15

Ile Ser Cys Tyr Val Lys Ala Glu Thr Gln Ser Ile Lys Asp Thr Lys
20 25 30

Glu Ala Ile Ser Ser Glu Val Asp Thr Gln Ser Thr Glu Asp Ser Glu
35 40 45

Leu Glu Thr Ile Ser Val Thr Ala Glu Lys Val Arg Asp Arg Lys Asp
50 55 60

Asn Glu Val Thr Gly Leu Gly Lys Ile Ile Lys Thr Ser Glu Ser Ile
65 70 75 80

Ser Arg Glu Gln Val Leu Asn Ile Arg Asp Leu Thr Arg Tyr Asp Pro
85 90 95

Gly Ile Ser Val Val Glu Gln Gly Arg Gly Ala Ser Ser Gly Tyr Ser
100 105 110

Ile Arg Gly Met Asp Arg Asn Arg Val Ala Leu Leu Val Asp Gly Leu
115 120 125

Pro Gln Thr Gln Ser Tyr Val Val Gln Ser Pro Leu Val Ala Arg Ser
130 135 140

Gly Tyr Ser Gly Thr Gly Ala Ile Asn Glu Ile Glu Tyr Glu Asn Val
145 150 155 160

Lys Ala Val Glu Ile Ser Lys Gly Gly Ser Ser Ser Glu Tyr Gly Asn
165 170 175

Gly Ala Leu Ala Gly Ser Val Thr Phe Gln Ser Lys Ser Ala Ala Asp
180 185 190

Ile Leu Glu Gly Asp Lys Ser Trp Gly Ile Gln Thr Lys Asn Ala Tyr
195 200 205

Ser Ser Lys Asn Lys Gly Phe Thr His Ser Leu Ala Val Ala Gly Lys
210 215 220

Gln Gly Gly Phe Glu Gly Val Ala Ile Tyr Thr His Arg Asn Ser Ile
225 230 235 240

Glu Thr Gln Val His Lys Asp Ala Leu Lys Gly Val Gln Ser Tyr Asp
245 250 255

Arg Phe Ile Ala Thr Thr Glu Asp Gln Ser Ala Tyr Phe Val Met Gln
260 265 270

Asp Glu Cys Leu Asp Gly Tyr Asp Lys Cys Lys Thr Ser Pro Lys Arg
275 280 285

Pro Ala Thr Leu Ser Thr Gln Arg Glu Thr Val Ser Val Ser Asp Tyr
290 295 300

Thr Gly Ala Asn Arg Ile Lys Pro Asn Pro Met Lys Tyr Glu Ser Gln

305 310 315 320
 Ser Trp Phe Leu Arg Gly Gly Tyr His Phe Ser Glu Gln His Tyr Ile
 325 330 335
 Gly Gly Ile Phe Glu Phe Thr Gln Gln Lys Phe Asp Ile Arg Asp Met
 340 345 350
 Thr Phe Pro Ala Tyr Leu Arg Pro Thr Glu Asp Lys Asp Leu Gln Ser
 355 360 365
 Arg Pro Phe Tyr Pro Lys Gln Asp Tyr Gly Ala Tyr Gln His Ile Gly
 370 375 380
 Asp Gly Arg Gly Val Lys Tyr Ala Ser Gly Leu Tyr Phe Asp Glu His
 385 390 395 400
 His Arg Lys Gln Arg Val Gly Ile Glu Tyr Ile Tyr Glu Asn Lys Asn
 405 410 415
 Lys Ala Gly Ile Ile Asp Lys Ala Val Leu Ser Ala Asn Gln Gln Asn
 420 425 430
 Ile Ile Leu Asp Ser Tyr Met Arg His Thr His Cys Ser Leu Tyr Pro
 435 440 445
 Asn Pro Ser Lys Asn Cys Arg Pro Thr Leu Asp Lys Pro Tyr Ser Tyr
 450 455 460
 Tyr His Ser Asp Arg Asn Val Tyr Lys Glu Lys His Asn Met Leu Gln
 465 470 475 480
 Leu Asn Leu Glu Lys Lys Ile Gln Gln Asn Trp Leu Thr His Gln Ile
 485 490 495
 Ala Phe Asn Leu Gly Phe Asp Asp Phe Thr Ser Ala Leu Gln His Lys
 500 505 510
 Asp Tyr Leu Thr Arg Arg Val Ile Ala Thr Ala Ser Ser Ile Ser Glu
 515 520 525
 Lys Arg Gly Glu Ala Arg Arg Asn Gly Leu Gln Ser Ser Pro Tyr Leu
 530 535 540
 Tyr Pro Thr Pro Lys Ala Glu Leu Val Gly Gly Asp Leu Cys Asn Tyr
 545 550 555 560
 Gln Gly Lys Ser Ser Asn Tyr Ser Asp Cys Lys Val Arg Leu Ile Lys
 565 570 575
 Gly Lys Asn Tyr Tyr Phe Ala Ala Arg Asn Asn Met Ala Leu Gly Lys
 580 585 590
 Tyr Val Asp Leu Gly Leu Gly Met Arg Tyr Asp Val Ser Arg Thr Lys
 595 600 605
 Ala Asn Glu Ser Thr Ile Ser Val Gly Lys Phe Lys Asn Phe Ser Trp
 610 615 620

Asn Thr Gly Ile Val Ile Lys Pro Thr Glu Trp Leu Asp Leu Ser Tyr
 625 630 635 640
 Arg Leu Ser Thr Gly Phe Arg Asn Pro Ser Phe Ala Glu Met Tyr Gly
 645 650 655
 Trp Arg Tyr Gly Gly Lys Asp Thr Asp Val Tyr Ile Gly Lys Phe Lys
 660 665 670
 Pro Glu Thr Ser Arg Asn Gln Glu Phe Gly Leu Ala Leu Lys Gly Asp
 675 680 685
 Phe Gly Asn Ile Glu Ile Ser His Phe Ser Asn Ala Tyr Arg Asn Leu
 690 695 700
 Ile Ala Phe Ala Glu Glu Leu Ser Lys Asn Gly Thr Thr Gly Lys Gly
 705 710 715 720
 Asn Tyr Gly Tyr His Asn Ala Gln Asn Ala Lys Leu Val Gly Val Asn
 725 730 735
 Ile Thr Ala Gln Leu Asp Phe Asn Gly Leu Trp Lys Arg Ile Pro Tyr
 740 745 750
 Gly Trp Tyr Ala Thr Phe Ala Tyr Asn Arg Val Lys Val Lys Asp Gln
 755 760 765
 Lys Ile Asn Ala Gly Leu Ala Ser Val Ser Ser Tyr Leu Phe Asp Ala
 770 775 780
 Ile Gln Pro Ser Arg Tyr Ile Ile Gly Leu Gly Tyr Asp His Pro Ser
 785 790 795 800
 Asn Thr Trp Gly Ile Lys Thr Met Phe Thr Gln Ser Lys Ala Lys Ser
 805 810 815
 Gln Asn Glu Leu Leu Gly Lys Arg Ala Leu Gly Asn Asn Ser Arg Asn
 820 825 830
 Val Lys Ser Thr Arg Lys Leu Thr Arg Ala Trp His Ile Leu Asp Val
 835 840 845
 Ser Gly Tyr Tyr Met Val Asn Arg Ser Ile Leu Phe Arg Leu Gly Val
 850 855 860
 Tyr Asn Leu Leu Asn Tyr Arg Tyr Val Thr Trp Glu Ala Val Arg Gln
 865 870 875 880
 Thr Ala Gln Gly Ala Val Asn Gln His Gln Asn Val Gly Asn Tyr Thr
 885 890 895
 Arg Tyr Ala Ala Ser Gly Arg Asn Tyr Thr Leu Thr Leu Glu Met Lys
 900 905 910
 Phe

<211> 644

<212> PRT

<213> Haemophilus influenzae

<400> 6

Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
1 5 10 15

Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Thr
20 25 30

Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Ser Ser Arg Thr
35 40 45

Lys Ser Lys Leu Glu Lys Leu Ser Ile Pro Ser Leu Gly Gly Gly Met
50 55 60

Lys Leu Ala Ala Leu Asn Leu Phe Asp Arg Asn Lys Pro Ser Leu Leu
65 70 75 80

Asn Glu Asp Ser Tyr Met Ile Phe Ser Ser Arg Ser Thr Ile Glu Glu
85 90 95

Asp Val Lys Asn Asp Asn Gln Asn Gly Glu His Pro Ile Asp Ser Ile
100 105 110

Val Asp Pro Arg Ala Pro Asn Ser Asn Glu Asn Arg His Gly Gln Lys
115 120 125

Tyr Val Tyr Ser Gly Leu Tyr Tyr Ile Gln Ser Trp Ser Leu Arg Asp
130 135 140

Leu Pro Asn Lys Lys Phe Tyr Ser Gly Tyr Tyr Gly Tyr Ala Tyr Tyr
145 150 155 160

Phe Gly Asn Thr Thr Ala Ser Ala Leu Pro Val Gly Gly Val Ala Thr
165 170 175

Tyr Lys Gly Thr Trp Ser Phe Ile Thr Ala Ala Glu Asn Gly Lys Asn
180 185 190

Tyr Glu Leu Leu Arg Asn Ser Gly Gly Gly Gln Ala Tyr Ser Arg Arg
195 200 205

Ser Ala Thr Pro Glu Asp Ile Asp Leu Asp Arg Lys Thr Gly Leu Thr
210 215 220

Ser Glu Phe Thr Val Asn Phe Gly Thr Lys Lys Leu Thr Gly Gly Leu
225 230 235 240

Tyr Tyr Asn Leu Arg Glu Thr Asp Ala Asn Lys Ser Gln Asn Arg Thr
245 250 255

His Lys Leu Tyr Asp Leu Glu Ala Asp Val His Ser Asn Arg Phe Arg
260 265 270

Gly Lys Val Lys Pro Thr Lys Lys Glu Ser Ser Glu Glu His Pro Phe
275 280 285

Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Glu Gly Gln
290 295 300

Glu Leu Gly Gly Lys Phe Leu Ala His Asp Lys Lys Val Leu Gly Val
305 310 315 320

Phe Ser Ala Lys Glu Gln Gln Glu Thr Ser Glu Asn Lys Lys Leu Pro
325 330 335

Lys Glu Thr Leu Ile Asp Gly Lys Leu Thr Thr Phe Lys Thr Thr Asn
340 345 350

Ala Thr Ala Asn Ala Thr Thr Asp Ala Thr Thr Ser Thr Thr Ala Ser
355 360 365

Thr Lys Thr Asp Thr Thr Thr Asn Ala Thr Ala Asn Thr Glu Asn Phe
370 375 380

Thr Thr Lys Asp Ile Pro Ser Leu Gly Glu Ala Asp Tyr Leu Leu Ile
385 390 395 400

Asp Asn Tyr Pro Val Pro Leu Phe Pro Glu Ser Gly Asp Phe Ile Ser
405 410 415

Ser Lys His His Thr Val Gly Lys Lys Thr Tyr Gln Val Glu Ala Cys
420 425 430

Cys Ser Asn Leu Ser Tyr Val Lys Phe Gly Met Tyr Tyr Glu Ala Pro
435 440 445

Pro Lys Glu Glu Glu Lys Glu Lys Glu Lys Asp Lys Asp Lys Glu Lys
450 455 460

Glu Lys Gln Ala Thr Thr Ser Ile Lys Thr Tyr Tyr Gln Phe Leu Leu
465 470 475 480

Gly Leu Arg Thr Pro Ser Ser Glu Ile Pro Lys Glu Gly Ser Ala Lys
485 490 495

Tyr His Gly Asn Trp Phe Gly Tyr Ile Ser Asp Gly Glu Thr Ser Tyr
500 505 510

Ser Ala Ser Gly Asp Lys Glu Arg Ser Lys Asn Ala Val Ala Glu Phe
515 520 525

Asn Val Asn Phe Ala Glu Lys Thr Leu Thr Gly Glu Leu Lys Arg His
530 535 540

Asp Thr Gln Asn Pro Val Phe Lys Ile Asn Ala Thr Phe Gln Ser Gly
545 550 555 560

Lys Asn Asp Phe Thr Gly Thr Ala Thr Ala Lys Asp Leu Ala Ile Asp
565 570 575

Gly Lys Asn Thr Gln Gly Thr Ser Lys Val Asn Phe Thr Ala Thr Val
580 585 590

Asn Gly Ala Phe Tyr Gly Pro His Ala Thr Glu Leu Gly Gly Tyr Phe
595 600 605

B1

Thr Tyr Asn Gly Asn Asn Pro Thr Asp Lys Asn Ser Ser Ser Asn Ser
610 615 620

Glu Lys Ala Arg Ala Ala Val Val Phe Gly Ala Lys Lys Gln Gln Val
625 630 635 640

Glu Thr Thr Lys

<210> 7

<211> 912

<212> PRT

<213> Haemophilus influenzae

<400> 7

Met Thr Lys Lys Pro Tyr Phe Arg Leu Ser Ile Ile Ser Cys Leu Leu
1 5 10 15

Ile Ser Cys Tyr Val Lys Ala Glu Thr Gln Ser Ile Lys Asp Thr Lys
20 25 30

Glu Ala Ile Ser Ser Glu Val Asp Thr Gln Ser Thr Glu Asp Ser Glu
35 40 45

Leu Glu Thr Ile Ser Val Thr Ala Glu Lys Ile Arg Asp Arg Lys Asp
50 55 60

Asn Glu Val Thr Gly Leu Gly Lys Ile Ile Lys Thr Ser Glu Ser Ile
65 70 75 80

Ser Arg Glu Gln Val Leu Asn Ile Arg Asp Leu Thr Arg Tyr Asp Pro
85 90 95

Gly Ile Ser Val Val Glu Gln Gly Arg Gly Ala Ser Ser Gly Tyr Ser
100 105 110

Ile Arg Gly Met Asp Arg Asn Arg Val Ala Leu Leu Val Asp Gly Leu
115 120 125

Pro Gln Thr Gln Ser Tyr Val Val Gln Ser Pro Leu Val Ala Arg Ser
130 135 140

Gly Tyr Ser Gly Thr Gly Ala Ile Asn Glu Ile Glu Tyr Glu Asn Val
145 150 155 160

Lys Ala Val Glu Ile Ser Lys Gly Gly Ser Ser Ser Glu Tyr Gly Asn
165 170 175

Gly Ala Leu Ala Gly Ser Val Thr Phe Gln Ser Lys Ser Ala Ala Asp
180 185 190

Ile Leu Glu Gly Asp Lys Ser Trp Gly Ile Gln Thr Lys Asn Ala Tyr
195 200 205

Ser Ser Lys Asn Lys Gly Phe Thr His Ser Leu Ala Val Ala Gly Lys
210 215 220

Gln Gly Gly Phe Glu Gly Leu Ala Ile Tyr Thr Gln Arg Asn Ser Ile
 225 230 235 240
 Glu Thr Gln Val His Lys Asp Ala Leu Lys Gly Val Gln Ser Tyr Asp
 245 250 255
 Arg Leu Ile Ala Thr Thr Asp Lys Ser Ser Gly Tyr Phe Val Ile Gln
 260 265 270
 Gly Glu Cys Pro Asn Gly Asp Asp Lys Cys Ala Ala Lys Pro Pro Ala
 275 280 285
 Thr Leu Ser Thr Gln Ser Glu Thr Val Ser Val Ser Asp Tyr Thr Gly
 290 295 300
 Ala Asn Arg Ile Lys Pro Asn Pro Met Lys Tyr Glu Ser Gln Ser Trp
 305 310 315 320
 Phe Leu Arg Gly Gly Tyr His Phe Ser Glu Gln His Tyr Ile Gly Gly
 325 330 335
 Ile Phe Glu Phe Thr Gln Gln Lys Phe Asp Ile Arg Asp Met Thr Phe
 340 345 350
 Pro Ala Tyr Leu Ser Pro Thr Glu Arg Arg Asp Asp Ser Ser Arg Ser
 355 360 365
 Phe Tyr Pro Met Gln Asp His Gly Ala Tyr Gln His Ile Glu Asp Gly
 370 375 380
 Arg Gly Val Lys Tyr Ala Ser Gly Leu Tyr Phe Asp Glu His His Arg
 385 390 395 400
 Lys Gln Arg Val Gly Ile Glu Tyr Ile Tyr Glu Asn Lys Asn Lys Ala
 405 410 415
 Gly Ile Ile Asp Lys Ala Val Leu Ser Ala Asn Gln Gln Asn Ile Ile
 420 425 430
 Leu Asp Ser Tyr Met Arg His Thr His Cys Ser Leu Tyr Pro Asn Pro
 435 440 445
 Ser Lys Asn Cys Arg Pro Thr Leu Asp Lys Pro Tyr Ser Tyr Tyr Arg
 450 455 460
 Ser Asp Arg Asn Val Tyr Lys Glu Lys His Asn Met Leu Gln Leu Asn
 465 470 475 480
 Leu Glu Lys Lys Ile Gln Gln Asn Trp Leu Thr His Gln Ile Val Phe
 485 490 495
 Asn Leu Gly Phe Asp Asp Phe Thr Ser Ala Leu Gln His Lys Asp Tyr
 500 505 510
 Leu Thr Arg Arg Val Ile Ala Thr Ala Asp Ser Ile Pro Arg Lys Pro
 515 520 525
 Gly Glu Thr Gly Lys Pro Arg Asn Gly Leu Gln Ser Gln Pro Tyr Leu
 530 535 540

Tyr Pro Lys Pro Glu Pro Tyr Phe Ala Gly Gln Asp His Cys Asn Tyr
545 550 555 560

Gln Gly Ser Ser Ser Asn Tyr Arg Asp Cys Lys Val Arg Leu Ile Lys
565 570 575

Gly Lys Asn Tyr Tyr Phe Ala Ala Arg Asn Asn Met Ala Leu Gly Lys
580 585 590

Tyr Val Asp Leu Gly Leu Gly Ile Arg Tyr Asp Val Ser Arg Thr Lys
595 600 605

Ala Asn Glu Ser Thr Ile Ser Val Gly Lys Phe Lys Asn Phe Ser Trp
610 615 620

Asn Thr Gly Ile Val Ile Lys Pro Thr Glu Trp Leu Asp Leu Ser Tyr
625 630 635 640

Arg Leu Ser Thr Gly Phe Arg Asn Pro Ser Phe Ser Glu Met Tyr Gly
645 650 655

Trp Arg Tyr Gly Gly Lys Asn Asp Glu Val Tyr Val Gly Lys Phe Lys
660 665 670

Pro Glu Thr Ser Arg Asn Gln Glu Phe Gly Leu Ala Leu Lys Gly Asp
675 680 685

Phe Gly Asn Ile Glu Ile Ser His Phe Ser Asn Ala Tyr Arg Asn Leu
690 695 700

Ile Ala Phe Ala Glu Glu Leu Ser Lys Asn Gly Thr Gly Lys Gly Asn
705 710 715 720

Tyr Gly Tyr His Asn Ala Gln Asn Ala Lys Leu Val Gly Val Asn Ile
725 730 735

Thr Ala Gln Leu Asp Phe Asn Gly Leu Trp Lys Arg Ile Pro Tyr Gly
740 745 750

Trp Tyr Ala Thr Phe Ala Tyr Asn Gln Val Lys Val Lys Asp Gln Lys
755 760 765

Ile Asn Ala Gly Leu Ala Ser Val Ser Ser Tyr Leu Phe Asp Ala Ile
770 775 780

Gln Pro Ser Arg Tyr Ile Ile Gly Leu Gly Tyr Asp His Pro Ser Asn
785 790 795 800

Thr Trp Gly Ile Asn Thr Met Phe Thr Gln Ser Lys Ala Lys Ser Gln
805 810 815

Asn Glu Leu Leu Gly Lys Arg Ala Leu Gly Asn Asn Ser Arg Asp Val
820 825 830

Lys Ser Thr Arg Lys Leu Thr Arg Ala Trp His Ile Leu Asp Val Ser
835 840 845

Gly Tyr Tyr Met Ala Asn Lys Asn Ile Met Leu Arg Leu Gly Ile Tyr

850 855 860

Asn Leu Phe Asn Tyr Arg Tyr Val Thr Trp Glu Ala Val Arg Gln Thr
865 870 875 880

Ala Gln Gly Ala Val Asn Gln His Gln Asn Val Gly Ser Tyr Thr Arg
885 890 895

Tyr Ala Ala Ser Gly Arg Asn Tyr Thr Leu Thr Leu Glu Met Lys Phe
900 905 910

<210> 8
<211> 660
<212> PRT
<213> Haemophilus influenzae

<400> 8

Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
1 5 10 15

Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Thr
20 25 30

Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Lys
35 40 45

Lys Ser Asn Leu Lys Lys Leu Phe Ile Pro Ser Leu Gly Gly Gly Met
50 55 60

Lys Leu Val Ala Gln Asn Leu Arg Gly Asn Lys Glu Pro Ser Phe Leu
65 70 75 80

Asn Glu Asp Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Thr Ile Glu
85 90 95

Lys Asp Val Lys Asp Asn Asn Lys Asn Gly Ala Asp Leu Ile Gly Ser
100 105 110

Ile Asp Glu Pro Ser Thr Thr Asn Pro Pro Glu Lys His His Gly Gln
115 120 125

Lys Tyr Val Tyr Ser Gly Leu Tyr Tyr Thr Pro Ser Trp Ser Leu Asn
130 135 140

Asp Ser Lys Asn Lys Phe Tyr Leu Gly Tyr Tyr Gly Tyr Ala Phe Tyr
145 150 155 160

Tyr Gly Asn Lys Thr Ala Thr Asn Leu Pro Val Asn Gly Val Ala Lys
165 170 175

Tyr Lys Gly Thr Trp Asp Phe Ile Thr Ala Thr Lys Asn Gly Lys Arg
180 185 190

Tyr Pro Leu Leu Ser Asn Gly Ser His Ala Tyr Tyr Arg Arg Ser Ala
195 200 205

Ile Pro Glu Asp Ile Asp Leu Glu Asn Asp Ser Lys Asn Gly Asp Ile
 210 215 220
 Gly Leu Ile Ser Glu Phe Ser Ala Asp Phe Gly Thr Lys Lys Leu Thr
 225 230 235 240
 Gly Gln Leu Ser Tyr Thr Lys Arg Lys Thr Asn Asn Gln Pro Tyr Glu
 245 250 255
 Lys Lys Lys Leu Tyr Asp Ile Asp Ala Asp Ile Tyr Ser Asn Arg Phe
 260 265 270
 Arg Gly Thr Val Lys Pro Thr Glu Lys Asp Ser Glu Glu His Pro Phe
 275 280 285
 Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn Ala Glu
 290 295 300
 Glu Leu Gly Gly Lys Phe Leu Ala Thr Asp Asn Arg Val Phe Gly Val
 305 310 315 320
 Phe Ser Ala Lys Glu Thr Glu Glu Thr Lys Lys Glu Ala Leu Ser Lys
 325 330 335
 Glu Thr Leu Ile Asp Gly Lys Leu Ile Thr Phe Ser Thr Lys Lys Thr
 340 345 350
 Asp Ala Lys Thr Asn Ala Thr Thr Ser Thr Ala Ala Asn Thr Thr Thr
 355 360 365
 Asp Thr Thr Ala Asn Thr Ile Thr Asp Glu Lys Asn Phe Lys Thr Glu
 370 375 380
 Asp Ile Ser Ser Phe Gly Glu Ala Asp Tyr Leu Leu Ile Asp Lys Tyr
 385 390 395 400
 Pro Ile Pro Leu Leu Pro Asp Lys Asn Thr Asn Asp Phe Ile Ser Ser
 405 410 415
 Lys His His Thr Val Gly Asn Lys Arg Tyr Lys Val Glu Ala Cys Cys
 420 425 430
 Ser Asn Leu Ser Tyr Val Lys Phe Gly Met Tyr Tyr Glu Asp Pro Leu
 435 440 445
 Lys Glu Lys Glu Thr Glu Thr Glu Thr Glu Thr Glu Lys Asp Lys Glu
 450 455 460
 Lys Glu Lys Glu Lys Asp Lys Asp Lys Glu Lys Gln Thr Ala Ala Thr
 465 470 475 480
 Thr Asn Thr Tyr Tyr Gln Phe Leu Leu Gly His Arg Thr Pro Lys Asp
 485 490 495
 Asp Ile Pro Lys Thr Gly Ser Ala Lys Tyr His Gly Ser Trp Phe Gly
 500 505 510
 Tyr Ile Thr Asp Gly Lys Thr Ser Tyr Ser Pro Ser Gly Asp Lys Lys
 515 520 525

Arg Asp Lys Asn Ala Val Ala Glu Phe Asn Val Asp Phe Ala Glu Lys
 530 535 540
 Lys Leu Thr Gly Glu Leu Lys Arg His Asp Thr Gly Asn Pro Val Phe
 545 550 555 560
 Ser Ile Glu Ala Asn Phe Asn Asn Ser Ser Asn Ala Phe Thr Gly Thr
 565 570 575
 Ala Thr Ala Thr Asn Phe Val Ile Asp Gly Lys Asn Ser Gln Asn Lys
 580 585 590
 Asn Thr Pro Ile Asn Ile Thr Thr Lys Val Asn Gly Ala Phe Tyr Gly
 595 600 605
 Pro Lys Ala Ser Glu Leu Gly Gly Tyr Phe Thr Tyr Asn Gly Asn Ser
 610 615 620
 Thr Ala Thr Asn Ser Glu Ser Ser Ser Thr Val Ser Ser Ser Ser Asn
 625 630 635 640
 Ser Lys Asn Ala Arg Ala Ala Val Val Phe Gly Ala Arg Gln Gln Val
 645 650 655
 Glu Thr Thr Lys
 660

<210> 9
 <211> 912
 <212> PRT
 <213> Haemophilus influenzae

<400> 9
 Met Thr Lys Lys Pro Tyr Phe Arg Leu Ser Ile Ile Ser Cys Leu Leu
 1 5 10 15
 Ile Ser Cys Tyr Val Lys Ala Glu Thr Gln Ser Ile Lys Asp Thr Lys
 20 25 30
 Glu Ala Ile Ser Ser Glu Val Asp Thr Gln Ser Thr Glu Asp Ser Glu
 35 40 45
 Leu Glu Thr Ile Ser Val Thr Ala Glu Lys Ile Arg Asp Arg Lys Asp
 50 55 60
 Asn Glu Val Thr Gly Leu Gly Lys Ile Ile Lys Thr Ser Glu Ser Ile
 65 70 75 80
 Ser Arg Glu Gln Val Leu Asn Ile Arg Asp Leu Thr Arg Tyr Asp Pro
 85 90 95
 Gly Ile Ser Val Val Glu Gln Gly Arg Gly Ala Ser Ser Gly Tyr Ser
 100 105 110
 Ile Arg Gly Met Asp Arg Asn Arg Val Ala Leu Leu Val Asp Gly Leu
 115 120 125

Pro Gln Thr Gln Ser Tyr Val Val Gln Ser Pro Leu Val Ala Arg Ser
 130 135 140
 Gly Tyr Ser Gly Thr Gly Ala Ile Asn Glu Ile Glu Tyr Glu Asn Val
 145 150 155 160
 Lys Ala Val Glu Ile Ser Lys Gly Gly Ser Ser Ser Glu Tyr Gly Asn
 165 170 175
 Gly Ala Leu Ala Gly Ser Val Thr Phe Gln Ser Lys Ser Ala Ala Asp
 180 185 190
 Ile Leu Glu Gly Asp Lys Ser Trp Gly Ile Gln Thr Lys Asn Ala Tyr
 195 200 205
 Ser Ser Lys Asn Lys Gly Phe Thr His Ser Leu Ala Val Ala Gly Lys
 210 215 220
 Gln Gly Gly Phe Glu Gly Leu Ala Ile Tyr Thr Gln Arg Asn Ser Ile
 225 230 235 240
 Glu Thr Gln Val His Lys Asp Ala Leu Lys Gly Val Gln Ser Tyr Asp
 245 250 255
 Arg Leu Ile Ala Thr Thr Asp Lys Ser Ser Gly Tyr Phe Val Ile Gln
 260 265 270
 Gly Glu Cys Pro Asn Gly Asp Asp Lys Cys Ala Ala Lys Pro Pro Ala
 275 280 285
 Thr Leu Ser Thr Gln Ser Glu Thr Val Ser Val Ser Asp Tyr Thr Gly
 290 295 300
 Ala Asn Arg Ile Lys Pro Asn Pro Met Lys Tyr Glu Ser Gln Ser Trp
 305 310 315 320
 Phe Leu Arg Gly Gly Tyr His Phe Ser Glu Gln His Tyr Ile Gly Gly
 325 330 335
 Ile Phe Glu Phe Thr Gln Gln Lys Phe Asp Ile Arg Asp Met Thr Phe
 340 345 350
 Pro Ala Tyr Leu Ser Pro Thr Glu Arg Arg Asp Asp Ser Ser Arg Ser
 355 360 365
 Phe Tyr Pro Met Gln Asp His Gly Ala Tyr Gln His Ile Glu Asp Gly
 370 375 380
 Arg Gly Val Lys Tyr Ala Ser Gly Leu Tyr Phe Asp Glu His His Arg
 385 390 395 400
 Lys Gln Arg Val Gly Ile Glu Tyr Ile Tyr Glu Asn Lys Asn Lys Ala
 405 410 415
 Gly Ile Ile Asp Lys Ala Val Leu Ser Ala Asn Gln Gln Asn Ile Ile
 420 425 430
 Leu Asp Ser Tyr Met Arg His Thr His Cys Ser Leu Tyr Pro Asn Pro
 435 440 445

Ser Lys Asn Cys Arg Pro Thr Leu Asp Lys Pro Tyr Ser Tyr Tyr Arg
 450 455 460
 Ser Asp Arg Asn Val Tyr Lys Glu Lys His Asn Met Leu Gln Leu Asn
 465 470 475 480
 Leu Glu Lys Lys Ile Gln Gln Asn Trp Leu Thr His Gln Ile Val Phe
 485 490 495
 Asn Leu Gly Phe Asp Asp Phe Thr Ser Ala Leu Gln His Lys Asp Tyr
 500 505 510
 Leu Thr Arg Arg Val Ile Ala Thr Ala Asp Ser Ile Pro Arg Lys Pro
 515 520 525
 Gly Glu Thr Gly Lys Pro Arg Asn Gly Leu Gln Ser Gln Pro Tyr Leu
 530 535 540
 Tyr Pro Lys Pro Glu Pro Tyr Phe Ala Gly Gln Asp His Cys Asn Tyr
 545 550 555 560
 Gln Gly Ser Ser Ser Asn Tyr Arg Asp Cys Lys Val Arg Leu Ile Lys
 565 570 575
 Gly Lys Asn Tyr Tyr Phe Ala Ala Arg Asn Asn Met Ala Leu Gly Lys
 580 585 590
 Tyr Val Asp Leu Gly Leu Gly Ile Arg Tyr Asp Val Ser Arg Thr Lys
 595 600 605
 Ala Asn Glu Ser Thr Ile Ser Val Gly Lys Phe Lys Asn Phe Ser Trp
 610 615 620
 Asn Thr Gly Ile Val Ile Lys Pro Thr Glu Trp Leu Asp Leu Ser Tyr
 625 630 635 640
 Arg Leu Ser Thr Gly Phe Arg Asn Pro Ser Phe Ser Glu Met Tyr Gly
 645 650 655
 Trp Arg Tyr Gly Gly Lys Asn Asp Glu Val Tyr Val Gly Lys Phe Lys
 660 665 670
 Pro Glu Thr Ser Arg Asn Gln Glu Phe Gly Leu Ala Leu Lys Gly Asp
 675 680 685
 Phe Gly Asn Ile Glu Ile Ser His Phe Ser Asn Ala Tyr Arg Asn Leu
 690 695 700
 Ile Ala Phe Ala Glu Glu Leu Ser Lys Asn Gly Thr Gly Lys Gly Asn
 705 710 715 720
 Tyr Gly Tyr His Asn Ala Gln Asn Ala Lys Leu Val Gly Val Asn Ile
 725 730 735
 Thr Ala Gln Leu Asp Phe Asn Gly Leu Trp Lys Arg Ile Pro Tyr Gly
 740 745 750
 Trp Tyr Ala Thr Phe Ala Tyr Asn Gln Val Lys Val Lys Asp Gln Lys

755 760 765

Ile Asn Ala Gly Leu Ala Ser Val Ser Ser Tyr Leu Phe Asp Ala Ile
770 775 780

Gln Pro Ser Arg Tyr Ile Ile Gly Leu Gly Tyr Asp His Pro Ser Asn
785 790 795 800

Thr Trp Gly Ile Asn Thr Met Phe Thr Gln Ser Lys Ala Lys Ser Gln
805 810 815

Asn Glu Leu Leu Gly Lys Arg Ala Leu Gly Asn Asn Ser Arg Asp Val
820 825 830

Lys Ser Thr Arg Lys Leu Thr Arg Ala Trp His Ile Leu Asp Val Ser
835 840 845

Gly Tyr Tyr Met Ala Asn Lys Asn Ile Met Leu Arg Leu Gly Ile Tyr
850 855 860

Asn Leu Phe Asn Tyr Arg Tyr Val Thr Trp Glu Ala Val Arg Gln Thr
865 870 875 880

Ala Gln Gly Ala Val Asn Gln His Gln Asn Val Gly Ser Tyr Thr Arg
885 890 895

Tyr Ala Ala Ser Gly Arg Asn Tyr Thr Leu Thr Leu Glu Met Lys Phe
900 905 910

<210> 10
<211> 660
<212> PRT
<213> Haemophilus influenzae

<400> 10

Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
1 5 10 15

Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Thr
20 25 30

Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Lys
35 40 45

Lys Ser Asn Leu Lys Lys Leu Phe Ile Pro Ser Leu Gly Gly Gly Met
50 55 60

Lys Leu Val Ala Gln Asn Leu Arg Gly Asn Lys Glu Pro Ser Phe Leu
65 70 75 80

Asn Glu Asp Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Thr Ile Glu
85 90 95

Lys Asp Val Lys Asp Asn Asn Lys Asn Gly Ala Asp Leu Ile Gly Ser
100 105 110

Ile Asp Glu Pro Ser Thr Thr Asn Pro Pro Glu Lys His His Gly Gln
 115 120 125
 Lys Tyr Val Tyr Ser Gly Leu Tyr Tyr Thr Pro Ser Trp Ser Leu Asn
 130 135 140
 Asp Ser Lys Asn Lys Phe Tyr Leu Gly Tyr Tyr Gly Tyr Ala Phe Tyr
 145 150 155 160
 Tyr Gly Asn Lys Thr Ala Thr Asn Leu Pro Val Asn Gly Val Ala Lys
 165 170 175
 Tyr Lys Gly Thr Trp Asp Phe Ile Thr Ala Thr Lys Asn Gly Lys Arg
 180 185 190
 Tyr Pro Leu Leu Ser Asn Gly Ser His Ala Tyr Tyr Arg Arg Ser Ala
 195 200 205
 Ile Pro Glu Asp Ile Asp Leu Glu Asn Asp Ser Lys Asn Gly Asp Ile
 210 215 220
 Gly Leu Ile Ser Glu Phe Ser Ala Asp Phe Gly Thr Lys Lys Leu Thr
 225 230 235 240
 Gly Gln Leu Ser Tyr Thr Lys Arg Lys Thr Asn Asn Gln Pro Tyr Glu
 245 250 255
 Lys Lys Lys Leu Tyr Asp Ile Asp Ala Asp Ile Tyr Ser Asn Arg Phe
 260 265 270
 Arg Gly Thr Val Lys Pro Thr Glu Lys Asp Ser Glu Glu His Pro Phe
 275 280 285
 Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn Ala Glu
 290 295 300
 Glu Leu Gly Gly Lys Phe Leu Ala Thr Asp Asn Arg Val Phe Gly Val
 305 310 315 320
 Phe Ser Ala Lys Glu Thr Glu Glu Thr Lys Lys Glu Ala Leu Ser Lys
 325 330 335
 Glu Thr Leu Ile Asp Gly Lys Leu Ile Thr Phe Ser Thr Lys Lys Thr
 340 345 350
 Asp Ala Lys Thr Asn Ala Thr Thr Ser Thr Ala Ala Asn Thr Thr Thr
 355 360 365
 Asp Thr Thr Ala Asn Thr Ile Thr Asp Glu Lys Asn Phe Lys Thr Glu
 370 375 380
 Asp Ile Ser Ser Phe Gly Glu Ala Asp Tyr Leu Leu Ile Asp Lys Tyr
 385 390 395 400
 Pro Ile Pro Leu Leu Pro Asp Lys Asn Thr Asn Asp Phe Ile Ser Ser
 405 410 415
 Lys His His Thr Val Gly Asn Lys Arg Tyr Lys Val Glu Ala Cys Cys

420 425 430
 Ser Asn Leu Ser Tyr Val Lys Phe Gly Met Tyr Tyr Glu Asp Pro Leu
 435 440 445
 Lys Glu Lys Glu Thr Glu Thr Glu Thr Glu Thr Glu Lys Asp Lys Glu
 450 455 460
 Lys Glu Lys Glu Lys Asp Lys Asp Lys Glu Lys Gln Thr Ala Ala Thr
 465 470 475 480
 Thr Asn Thr Tyr Tyr Gln Phe Leu Leu Gly His Arg Thr Pro Lys Asp
 485 490 495
 Asp Ile Pro Lys Thr Gly Ser Ala Lys Tyr His Gly Ser Trp Phe Gly
 500 505 510
 Tyr Ile Thr Asp Gly Lys Thr Ser Tyr Ser Pro Ser Gly Asp Lys Lys
 515 520 525
 Arg Asp Lys Asn Ala Val Ala Glu Phe Asn Val Asp Phe Ala Glu Lys
 530 535 540
 Lys Leu Thr Gly Glu Leu Lys Arg His Asp Thr Gly Asn Pro Val Phe
 545 550 555 560
 Ser Ile Glu Ala Asn Phe Asn Asn Ser Ser Asn Ala Phe Thr Gly Thr
 565 570 575
 Ala Thr Ala Thr Asn Phe Val Ile Asp Gly Lys Asn Ser Gln Asn Lys
 580 585 590
 Asn Thr Pro Ile Asn Ile Thr Thr Lys Val Asn Gly Ala Phe Tyr Gly
 595 600 605
 Pro Lys Ala Ser Glu Leu Gly Gly Tyr Phe Thr Tyr Asn Gly Asn Ser
 610 615 620
 Thr Ala Thr Asn Ser Glu Ser Ser Ser Thr Val Ser Ser Ser Ser Asn
 625 630 635 640
 Ser Lys Asn Ala Arg Ala Ala Val Val Phe Gly Ala Arg Gln Gln Val
 645 650 655
 Glu Thr Thr Lys
 660

<210> 11
 <211> 914
 <212> PRT
 <213> Haemophilus influenzae

<400> 11
 Met Thr Lys Lys Pro Tyr Phe Arg Leu Ser Ile Ile Ser Cys Leu Leu
 1 5 10 15
 Ile Ser Cys Tyr Val Lys Ala Glu Thr Gln Ser Ile Lys Asp Thr Lys
 20 25 30

Glu Ala Ile Ser Ser Glu Val Asp Thr Gln Ser Thr Glu Asp Ser Glu
 35 40 45
 Leu Glu Thr Ile Ser Val Thr Ala Glu Lys Ile Arg Asp Arg Lys Asp
 50 55 60
 Asn Glu Val Thr Gly Leu Gly Lys Ile Ile Lys Thr Ser Glu Ser Ile
 65 70 75 80
 Ser Arg Glu Gln Val Leu Asn Ile Arg Asp Leu Thr Arg Tyr Asp Pro
 85 90 95
 Gly Ile Ser Val Val Glu Gln Gly Arg Gly Ala Ser Ser Gly Tyr Ser
 100 105 110
 Ile Arg Gly Met Asp Arg Asn Arg Val Ala Leu Leu Val Asp Gly Leu
 115 120 125
 Pro Gln Thr Gln Ser Tyr Val Val Gln Ser Pro Leu Val Ala Arg Ser
 130 135 140
 Gly Tyr Ser Gly Thr Gly Ala Ile Asn Glu Ile Glu Tyr Glu Asn Val
 145 150 155 160
 Lys Ala Val Glu Ile Ser Lys Gly Gly Ser Ser Ser Glu Tyr Gly Asn
 165 170 175
 Gly Ala Leu Ala Gly Ser Val Thr Phe Gln Ser Lys Ser Ala Ala Asp
 180 185 190
 Ile Leu Glu Gly Asp Lys Ser Trp Gly Ile Gln Thr Lys Asn Ala Tyr
 195 200 205
 Ser Ser Lys Asn Lys Gly Phe Thr His Ser Leu Ala Val Ala Gly Lys
 210 215 220
 Gln Gly Gly Phe Asp Gly Val Ala Ile Tyr Thr Gln Arg Asn Ser Ile
 225 230 235 240
 Glu Thr Gln Val His Lys Asp Ala Leu Lys Gly Val Gln Ser Tyr His
 245 250 255
 Arg Leu Ile Ala Lys Pro Glu Asp Gln Ser Ala Tyr Phe Val Met Gln
 260 265 270
 Asp Glu Cys Pro Lys Pro Asp Asp Tyr Asn Ser Cys Leu Pro Phe Ala
 275 280 285
 Lys Arg Pro Ala Ile Leu Ser Ser Gln Arg Glu Thr Val Ser Val Ser
 290 295 300
 Asp Tyr Thr Gly Ala Asn Arg Ile Lys Pro Asn Pro Met Lys Tyr Glu
 305 310 315 320
 Ser Gln Ser Trp Phe Leu Arg Gly Gly Tyr His Phe Ser Glu Gln His
 325 330 335
 Tyr Ile Gly Gly Ile Phe Glu Phe Thr Gln Gln Lys Phe Asp Ile Arg

340 345 350
 Asp Met Thr Phe Pro Ala Tyr Leu Arg Ser Thr Glu Lys Arg Asp Asp
 355 360 365
 Ser Ser Gly Ser Phe Tyr Pro Lys Gln Asp Tyr Gly Ala Tyr Gln Arg
 370 375 380
 Ile Glu Asp Gly Arg Gly Val Asn Tyr Ala Ser Gly Leu Tyr Phe Asp
 385 390 395 400
 Glu His His Arg Lys Gln Arg Val Gly Ile Glu Tyr Ile Tyr Glu Asn
 405 410 415
 Lys Asn Lys Ala Gly Ile Ile Asp Lys Ala Val Leu Ser Ala Asn Gln
 420 425 430
 Gln Asn Ile Ile Leu Asp Ser Tyr Met Gln His Thr His Cys Ser Leu
 435 440 445
 Tyr Pro Asn Pro Ser Lys Asn Cys Arg Pro Thr Arg Asp Lys Pro Tyr
 450 455 460
 Ser Tyr Tyr His Ser Asp Arg Asn Val Tyr Lys Glu Lys His Asn Met
 465 470 475 480
 Leu Gln Leu Asn Leu Glu Lys Lys Ile Gln Gln Asn Trp Leu Thr His
 485 490 495
 Gln Ile Val Phe Asn Leu Gly Phe Asp Asp Phe Thr Ser Ala Leu Gln
 500 505 510
 His Lys Asp Tyr Leu Thr Arg Arg Val Thr Ala Thr Ala Lys Ser Ile
 515 520 525
 Ser Glu Lys Ala Asn Glu Thr Arg Arg Asn Gly Tyr Lys Lys Gln Pro
 530 535 540
 Tyr Leu Tyr Pro Lys Pro Thr Val Gly Phe Val Val Gln Asp His Cys
 545 550 555 560
 Asp Tyr Lys Gly Asn Ser Ser Asn Tyr Arg Asp Cys Lys Val Arg Leu
 565 570 575
 Ile Lys Gly Lys Asn Tyr Tyr Phe Ala Ala Arg Asn Asn Met Ala Leu
 580 585 590
 Gly Lys Tyr Val Asp Leu Gly Leu Gly Ile Arg Tyr Asp Val Ser Arg
 595 600 605
 Thr Lys Ala Asn Glu Ser Thr Ile Ser Val Gly Lys Phe Lys Asn Phe
 610 615 620
 Ser Trp Asn Thr Gly Ile Val Ile Lys Pro Thr Glu Trp Leu Asp Leu
 625 630 635 640
 Ser Tyr Arg Leu Ser Thr Gly Phe Arg Asn Pro Ser Phe Ala Glu Met
 645 650 655

Tyr Gly Trp Arg Tyr Gly Gly Asn Asn Ser Glu Val Tyr Val Gly Lys
 660 665 670
 Phe Lys Pro Glu Thr Ser Arg Asn Gln Glu Phe Gly Leu Ala Leu Lys
 675 680 685
 Gly Asp Phe Gly Asn Ile Glu Ile Ser His Phe Ser Asn Ala Tyr Arg
 690 695 700
 Asn Leu Ile Ala Phe Ala Glu Glu Leu Asn Lys Asn Gly Thr Gly Lys
 705 710 715 720
 Ala Asn Tyr Gly Tyr His Asn Ala Gln Asn Ala Lys Leu Val Gly Val
 725 730 735
 Asn Ile Thr Ala Gln Leu Asp Phe Asn Gly Leu Trp Lys Arg Ile Pro
 740 745 750
 Tyr Gly Trp Tyr Ala Thr Phe Ala Tyr Asn Arg Val Lys Val Lys Asp
 755 760 765
 Gln Lys Ile Asn Ala Gly Leu Ala Ser Val Ser Ser Tyr Leu Phe Asp
 770 775 780
 Ala Ile Gln Pro Ser Arg Tyr Ile Ile Gly Leu Gly Tyr Asp His Pro
 785 790 795 800
 Ser Asn Thr Trp Gly Ile Asn Thr Met Phe Thr Gln Ser Lys Ala Lys
 805 810 815
 Ser Gln Asn Glu Leu Leu Gly Lys Arg Ala Leu Gly Asn Asn Ser Arg
 820 825 830
 Asp Val Lys Ser Thr Arg Lys Leu Thr Arg Ala Trp His Ile Leu Asp
 835 840 845
 Val Ser Gly Tyr Tyr Met Ala Asn Lys Asn Ile Met Leu Arg Leu Gly
 850 855 860
 Ile Tyr Asn Leu Phe Asn Tyr Arg Tyr Val Thr Trp Glu Ala Val Arg
 865 870 875 880
 Gln Thr Ala Gln Gly Ala Val Asn Gln His Gln Asn Val Gly Ser Tyr
 885 890 895
 Thr Arg Tyr Ala Ala Ser Gly Arg Asn Tyr Thr Leu Thr Leu Glu Met
 900 905 910

Lys Phe

<210> 12
 <211> 654
 <212> PRT
 <213> Haemophilus influenzae

<400> 12
 Met Lys Ser Val Pro Leu Ile Thr Gly Gly Leu Ser Phe Leu Leu Ser

1 5 10 15
 Ala Cys Ser Gly Gly Gly Gly Ser Phe Asp Val Asp Asp Val Ser Asn
 20 25 30
 Pro Ser Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg
 35 40 45
 Thr Lys Ser Asp Leu Glu Lys Leu Phe Ile Pro Ser Leu Gly Gly Gly
 50 55 60
 Met Lys Leu Val Ala Gln Asn Phe Ile Gly Ala Arg Glu Pro Ser Phe
 65 70 75 80
 Leu Asn Glu Asp Gly Tyr Met Ile Phe Ser Ser Leu Ser Thr Ile Glu
 85 90 95
 Glu Asp Val Glu Lys Val Lys Asn Asn Asn Lys Asn Gly Gly Arg Leu
 100 105 110
 Ile Gly Ser Ile Glu Glu Pro Asn Gly Thr Ser Gln Asn Ser Asn Ser
 115 120 125
 Gln Glu Tyr Val Tyr Ser Gly Leu Tyr Tyr Ile Asp Ser Trp Arg Asp
 130 135 140
 Tyr Lys Lys Glu Glu Gln Lys Ala Tyr Thr Gly Tyr Tyr Gly Tyr Ala
 145 150 155 160
 Phe Tyr Tyr Gly Asn Glu Thr Ala Lys Asn Leu Pro Val Lys Gly Val
 165 170 175
 Ala Lys Tyr Lys Gly Thr Trp Asn Phe Ile Thr Ala Thr Glu Asn Gly
 180 185 190
 Lys Arg Tyr Ser Leu Phe Ser Asn Ser Ile Gly Gln Ala Tyr Ser Arg
 195 200 205
 Arg Ser Ala Ile Ser Glu Asp Ile Tyr Asn Leu Glu Asn Gly Asp Ala
 210 215 220
 Gly Leu Ile Ser Glu Phe Ser Val Asp Phe Gly Lys Lys Glu Leu Thr
 225 230 235 240
 Gly Glu Leu Tyr Tyr Asn Glu Arg Lys Thr Ser Val Asn Glu Ser Gln
 245 250 255
 Asn Thr Thr His Lys Leu Tyr Thr Leu Glu Ala Lys Val Tyr Ser Asn
 260 265 270
 Arg Phe Arg Gly Lys Val Lys Pro Thr Lys Thr Lys Ser Glu Asp His
 275 280 285
 Pro Phe Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn
 290 295 300
 Ala Glu Glu Leu Gly Gly Lys Phe Leu Ala Asn Asp Glu Lys Val Phe
 305 310 315 320

Gly Val Phe Ser Ala Lys Glu Asp Pro Gln Asn Pro Glu Asn Gln Lys
 325 330 335
 Leu Ser Thr Glu Thr Leu Ile Asp Gly Lys Leu Ile Thr Phe Lys Arg
 340 345 350
 Thr Asp Ala Thr Thr Asn Ala Thr Thr Asp Ala Lys Thr Ser Ala Thr
 355 360 365
 Thr Asp Ala Thr Ser Thr Thr Ala Asn Lys Lys Thr Asp Ala Glu Asn
 370 375 380
 Phe Lys Thr Glu Asp Ile Pro Ser Phe Gly Glu Ala Asp Tyr Leu Leu
 385 390 395 400
 Ile Gly Asn Gln Pro Ile Pro Leu Leu Pro Glu Lys Asn Thr Asp Asp
 405 410 415
 Phe Ile Ser Ser Lys His His Thr Val Gly Gly Lys Thr Tyr Lys Val
 420 425 430
 Glu Ala Cys Cys Lys Asn Leu Ser Tyr Val Lys Phe Gly Met Tyr Tyr
 435 440 445
 Glu Asp Lys Asp Lys Asp Asn Lys Asn Glu Thr Asp Lys Glu Lys Gly
 450 455 460
 Lys Glu Lys Pro Thr Thr Thr Thr Ser Ile Asn Thr Tyr Tyr Gln Phe
 465 470 475 480
 Leu Leu Gly Leu Arg Thr Pro Lys Asp Glu Ile Pro Lys Glu Gly Ser
 485 490 495
 Ala Lys Tyr His Gly Asn Trp Phe Gly Tyr Ile Ser Asp Gly Glu Thr
 500 505 510
 Ser Tyr Ser Ala Ser Gly Asp Lys Glu Arg Ser Lys Asn Ala Val Ala
 515 520 525
 Glu Phe Asp Val Ser Phe Ala Asn Lys Thr Leu Thr Gly Glu Leu Lys
 530 535 540
 Arg His Asp Asn Gly Asn Thr Val Phe Lys Ile Asn Ala Glu Leu Asn
 545 550 555 560
 Gly Ser Asn Asp Phe Thr Gly Thr Ala Thr Ala Thr Asn Phe Val Ile
 565 570 575
 Asp Gly Asn Asn Ser Gln Thr Ser Asn Ala Lys Ile Asn Ile Thr Thr
 580 585 590
 Lys Val Asn Gly Ala Phe Tyr Gly Pro Lys Ala Ser Glu Leu Gly Gly
 595 600 605
 Tyr Phe Thr Tyr Asn Gly Lys Asn Pro Thr Ala Thr Asn Ser Glu Ser
 610 615 620
 Ser Ser Thr Val Pro Ser Pro Pro Asn Ser Pro Asn Ala Ser Ala Ala
 625 630 635 640

Val Val Phe Gly Ala Lys Lys Gln Val Glu Thr Thr Asn Lys
 645 650

<210> 13
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 13
 Ala Glu Thr Gln Ser Ile Lys Asp Thr Lys Glu Ala Ile Ser Ser Glu
 1 5 10 15

Val Asp Thr Gln Ser Thr Glu Asp Ser Glu Leu Glu Thr Ile Ser Val
 20 25 30

Thr Ala Glu Lys
 35

<210> 14
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 14
 Ser Val Thr Ala Glu Lys Val Arg Asp Arg Lys Asp Asn Glu Val Thr
 1 5 10 15

Gly Leu Gly Lys Ile Ile Lys Thr Ser Glu Ser Ile Ser Arg Glu Gln
 20 25 30

Val Leu Asn Ile
 35

<210> 15
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 15
 Ser Arg Glu Gln Val Leu Asn Ile Arg Asp Leu Thr Arg Tyr Asp Pro
 1 5 10 15

Gly Ile Ser Val Val Glu Gln Gly Arg Gly Ala Ser Ser Gly Tyr Ser
 20 25 30

Ile Arg Gly Met
 35

<210> 16
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 16

Gly Tyr Ser Ile Arg Gly Met Asp Arg Asn Arg Val Ala Leu Leu Val
 1 5 10 15

Asp Gly Leu Pro Gln Thr Gln Ser Tyr Val Val Gln Ser Pro Leu Val
 20 25 30

Ala Arg Ser Gly
 35

<210> 17

<211> 36

<212> PRT

<213> Haemophilus influenzae

<400> 17

Pro Leu Val Ala Arg Ser Gly Tyr Gly Thr Gly Ala Ile Asn Glu Ile
 1 5 10 15

Glu Tyr Glu Asn Val Lys Ala Val Glu Ile Ser Lys Gly Gly Ser Ser
 20 25 30

Ser Glu Tyr Gly
 35

<210> 18

<211> 36

<212> PRT

<213> Haemophilus influenzae

<400> 18

Ser Ser Ser Glu Tyr Gly Asn Gly Ala Leu Ala Gly Ser Val Thr Phe
 1 5 10 15

Gln Ser Lys Ser Ala Ala Asp Ile Leu Glu Gly Asp Lys Ser Trp Gly
 20 25 30

Ile Gln Thr Lys
 35

<210> 19

<211> 36

<212> PRT

<213> Haemophilus influenzae

<400> 19

Gly Ile Gln Thr Lys Asn Ala Tyr Ser Ser Lys Asn Lys Gly Phe Thr
 1 5 10 15

His Ser Leu Ala Val Ala Gly Lys Gln Gly Gly Phe Glu Gly Val Ala
 20 25 30

Ile Tyr Thr His
 35

<210> 20

<211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 20
 Gly Val Ala Ile Tyr Thr His Arg Asn Ser Ile Glu Thr Gln Val His
 1 5 10 15
 Lys Asp Ala Leu Lys Gly Val Gln Ser Tyr Asp Arg Phe Ile Ala Thr
 20 25 30
 Thr Glu Asp Gln
 35

<210> 21
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 21
 Ile Ala Thr Thr Glu Asp Gln Ser Ala Tyr Phe Val Met Gln Asp Glu
 1 5 10 15
 Cys Leu Asp Gly Tyr Asp Lys Cys Lys Thr Ser Pro Lys Arg Pro Ala
 20 25 30
 Thr Leu Ser Thr
 35

<210> 22
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 22
 Pro Ala Thr Leu Ser Thr Gln Arg Glu Thr Val Ser Val Ser Asp Tyr
 1 5 10 15
 Thr Gly Ala Asn Arg Ile Lys Pro Asn Pro Met Lys Tyr Glu Ser Gln
 20 25 30
 Ser Trp Phe Leu
 35

<210> 23
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 23
 Tyr Glu Ser Gln Ser Trp Phe Leu Arg Gly Gly Tyr His Phe Ser Glu
 1 5 10 15
 Gln His Tyr Ile Gly Gly Ile Phe Glu Phe Thr Gln Gln Lys Phe Asp
 20 25 30

Ile Arg Asp Met
35

<210> 24
<211> 36
<212> PRT
<213> Haemophilus influenzae

<400> 24
Lys Phe Asp Ile Arg Asp Met Thr Phe Pro Ala Tyr Leu Arg Pro Thr
1 5 10 15

Glu Asp Lys Asp Leu Gln Ser Arg Pro Phe Tyr Pro Lys Gln Asp Tyr
20 25 30

Gly Ala Tyr Gln
35

<210> 25
<211> 36
<212> PRT
<213> Haemophilus influenzae

<400> 25
Asp Tyr Gly Ala Tyr Gln His Ile Gly Asp Gly Arg Gly Val Lys Tyr
1 5 10 15

Ala Ser Gly Leu Tyr Phe Asp Glu His His Arg Lys Gln Arg Val Gly
20 25 30

Ile Glu Tyr Ile
35

<210> 26
<211> 36
<212> PRT
<213> Haemophilus influenzae

<400> 26
Gly Ile Glu Tyr Ile Tyr Glu Asn Lys Asn Lys Ala Gly Ile Ile Asp
1 5 10 15

Lys Ala Val Leu Ser Ala Asn Gln Gln Asn Ile Ile Leu Asp Ser Tyr
20 25 30

Met Arg His Thr
35

<210> 27
<211> 36
<212> PRT
<213> Haemophilus influenzae

<400> 27
Asp Ser Tyr Met Arg His Thr His Cys Ser Leu Tyr Pro Asn Pro Ser

1 5 10 15
 Lys Asn Cys Arg Pro Thr Leu Asp Lys Pro Tyr Ser Tyr Tyr His Ser
 20 25 30

Asp Arg Asn Val
 35

<210> 28
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 28
 Ser Asp Arg Asn Val Tyr Lys Glu Lys His Asn Met Leu Gln Leu Asn
 1 5 10 15

Leu Glu Lys Lys Ile Gln Gln Asn Trp Leu Thr His Gln Ile Ala Phe
 20 25 30

Asn Leu Gly Phe
 35

<210> 29
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 29
 Thr His Gln Ile Ala Phe Asn Leu Gly Phe Asp Asp Phe Thr Ser Ala
 1 5 10 15

Leu Gln His Lys Asp Tyr Leu Thr Arg Arg Val Ile Ala Thr Ala Ser
 20 25 30

Ser Ile Ser Glu
 35

<210> 30
 <211> 37
 <212> PRT
 <213> Haemophilus influenzae

<400> 30
 Thr Ala Ser Ser Ile Ser Glu Lys Arg Gly Glu Ala Arg Arg Asn Gly
 1 5 10 15

Leu Gln Ser Ser Pro Tyr Leu Tyr Pro Thr Pro Lys Ala Glu Leu Val
 20 25 30

Gly Gly Asp Leu Cys
 35

<210> 31
 <211> 36

<212> PRT

<213> Haemophilus influenzae

<400> 31

Leu Val Gly Gly Asp Leu Cys Asn Tyr Gln Gly Lys Ser Ser Asn Tyr
 1 5 10 15

Ser Asp Cys Lys Val Arg Leu Ile Lys Gly Lys Asn Tyr Tyr Phe Ala
 20 25 30

Ala Arg Asn Asn
 35

<210> 32

<211> 36

<212> PRT

<213> Haemophilus influenzae

<400> 32

Phe Ala Ala Arg Asn Asn Met Ala Leu Gly Lys Tyr Val Asp Leu Gly
 1 5 10 15

Leu Gly Met Arg Tyr Asp Val Ser Arg Thr Lys Ala Asn Glu Ser Thr
 20 25 30

Ile Ser Val Gly
 35

<210> 33

<211> 36

<212> PRT

<213> Haemophilus influenzae

<400> 33

Ser Thr Ile Ser Val Gly Lys Phe Lys Asn Phe Ser Trp Asn Thr Gly
 1 5 10 15

Ile Val Ile Lys Pro Thr Glu Trp Leu Asp Leu Ser Tyr Arg Leu Ser
 20 25 30

Thr Gly Phe Arg
 35

<210> 34

<211> 36

<212> PRT

<213> Haemophilus influenzae

<400> 34

Leu Ser Thr Gly Phe Arg Asn Pro Ser Phe Ala Glu Met Tyr Gly Trp
 1 5 10 15

Arg Tyr Gly Gly Lys Asp Thr Asp Val Tyr Ile Gly Lys Phe Lys Pro
 20 25 30

Glu Thr Ser Arg

35

<210> 35
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 35
 Lys Pro Glu Thr Ser Arg Asn Gln Glu Phe Gly Leu Ala Leu Lys Gly
 1 5 10 15
 Asp Phe Gly Asn Ile Glu Ile Ser His Phe Ser Asn Ala Tyr Arg Asn
 20 25 30
 Leu Ile Ala Phe
 35

<210> 36
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 36
 Tyr Arg Asn Leu Ile Ala Phe Ala Glu Glu Leu Ser Lys Asn Gly Thr
 1 5 10 15
 Thr Gly Lys Gly Asn Tyr Gly Tyr His Asn Ala Gln Asn Ala Lys Leu
 20 25 30
 Val Gly Val Asn
 35

<210> 37
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 37
 Ala Lys Leu Val Gly Val Asn Ile Thr Ala Gln Leu Asp Phe Asn Gly
 1 5 10 15
 Leu Trp Lys Arg Ile Pro Tyr Gly Trp Tyr Ala Thr Phe Ala Tyr Asn
 20 25 30
 Arg Val Lys Val
 35

<210> 38
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 38
 Ala Tyr Asn Arg Val Lys Val Lys Asp Gln Lys Ile Asn Ala Gly Leu
 1 5 10 15

Ala Ser Val Ser Ser Tyr Leu Phe Asp Ala Ile Gln Pro Ser Arg Tyr
 20 25 30

Ile Ile Gly Leu
 35

<210> 39
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 39
 Ser Arg Tyr Ile Ile Gly Leu Asp Tyr Asp His Pro Ser Asn Thr Trp
 1 5 10 15

Gly Ile Lys Thr Met Phe Thr Gln Ser Lys Ala Lys Ser Gln Asn Glu
 20 25 30

Leu Leu Gly Lys
 35

<210> 40
 <211> 36
 <212> PRT
 <213> Haemophilus influenzae

<400> 40
 Asn Glu Leu Leu Gly Lys Arg Ala Leu Gly Asn Asn Ser Arg Asn Val
 1 5 10 15

Lys Ser Thr Arg Lys Leu Thr Arg Ala Trp His Ile Leu Asp Val Ser
 20 25 30

Gly Tyr Tyr Met
 35

<210> 41
 <211> 30
 <212> PRT
 <213> Haemophilus influenzae

<400> 41
 Ser Gly Tyr Tyr Met Val Asn Arg Ser Ile Leu Phe Arg Leu Gly Val
 1 5 10 15

Tyr Asn Leu Leu Asn Tyr Arg Tyr Val Thr Trp Glu Ala Val
 20 25 30

<210> 42
 <211> 23
 <212> PRT
 <213> Haemophilus influenzae

<400> 42

Leu Leu Asn Tyr Arg Tyr Val Thr Trp Glu Ala Val Arg Gln Thr Ala
 1 5 10 15

Gln Gly Ala Glu Phe Asp Ile
 20

<210> 43

<211> 9

<212> PRT

<213> Haemophilus influenzae

<400> 43

Asp Asn Glu Val Thr Gly Leu Gly Lys
 1 5

<210> 44

<211> 16

<212> PRT

<213> Haemophilus influenzae

<400> 44

Glu Gln Val Leu Asn Ile Arg Asp Leu Thr Arg Tyr Asp Pro Gly Ile
 1 5 10 15

<210> 45

<211> 35

<212> PRT

<213> Haemophilus influenzae

<400> 45

Glu Gln Val Leu Asn Ile Arg Asp Leu Thr Arg Tyr Asp Pro Gly Ile
 1 5 10 15

Ser Val Val Glu Gln Gly Arg Gly Ala Ser Ser Gly Tyr Ser Ile Arg
 20 25 30

Gly Met Asp
 35

<210> 46

<211> 19

<212> PRT

<213> Haemophilus influenzae

<400> 46

Gly Ala Ile Asn Glu Ile Glu Tyr Glu Asn Val Lys Ala Val Glu Ile
 1 5 10 15

Ser Lys Gly

<210> 47

<211> 7

<212> PRT

<213> Haemophilus influenzae

<400> 47

Gly Ala Leu Ala Gly Ser Val
1 5

<210> 48

<211> 15

<212> PRT

<213> Haemophilus influenzae

<400> 48

Ala Glu Thr Gln Ser Ile Lys Asp Thr Lys Glu Ala Ile Ser Cys
1 5 10 15

<210> 49

<211> 14

<212> PRT

<213> Haemophilus influenzae

<400> 49

Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn
1 5 10

<210> 50

<211> 31

<212> PRT

<213> Haemophilus influenzae

<400> 50

Leu Glu Gly Gly Phe Tyr Gly Pro Lys Gly Glu Glu Leu Gly Phe Arg
1 5 10 15

Phe Leu Ala Gly Asp Lys Lys Val Phe Gly Val Phe Ser Ala Lys
20 25 30

<210> 51

<211> 23

<212> PRT

<213> Haemophilus influenzae

<400> 51

Thr Val Gly Lys Lys Thr Tyr Gln Val Glu Ala Cys Cys Ser Asn Leu
1 5 10 15

Ser Tyr Val Lys Phe Gly Met
20

<210> 52

<211> 23

<212> PRT

<213> Haemophilus influenzae

<400> 52

Ala Thr Val Lys Gly Ala Phe Tyr Gly Pro Lys Ala Ser Glu Leu Gly
 1 5 10 15

Gly Tyr Phe Thr Tyr Asn Gly
 20

<210> 53

<211> 35

<212> PRT

<213> Haemophilus influenzae

<400> 53

Met Lys Leu Ala Ala Leu Asn Leu Phe Asp Arg Asn Lys Pro Ser Leu
 1 5 10 15

Leu Asn Glu Asp Ser Tyr Met Ile Phe Ser Ser Arg Ser Thr Ile Glu
 20 25 30

Glu Asp Val
 35

<210> 54

<211> 35

<212> PRT

<213> Haemophilus influenzae

<400> 54

Ser Thr Ile Glu Glu Asp Val Lys Asn Asp Asn Gln Asn Gly Glu His
 1 5 10 15

Pro Ile Asp Ser Ile Val Asp Pro Arg Ala Pro Asn Ser Asn Glu Asn
 20 25 30

Arg His Gly
 35

<210> 55

<211> 35

<212> PRT

<213> Haemophilus influenzae

<400> 55

Ser Asn Glu Asn Arg His Gly Gln Lys Tyr Val Tyr Ser Gly Leu Tyr
 1 5 10 15

Tyr Ile Gln Ser Trp Ser Leu Arg Asp Leu Pro Asn Lys Lys Phe Tyr
 20 25 30

Ser Gly Tyr
 35

<210> 56

<211> 35

<212> PRT

<213> Haemophilus influenzae

<400> 56

Lys Lys Phe Tyr Ser Gly Tyr Tyr Gly Tyr Ala Tyr Tyr Phe Gly Asn
 1 5 10 15

Thr Thr Ala Ser Ala Leu Pro Val Gly Gly Val Ala Thr Tyr Lys Gly
 20 25 30

Thr Trp Ser
 35

<210> 57

<211> 35

<212> PRT

<213> Haemophilus influenzae

<400> 57

Thr Tyr Lys Gly Thr Trp Ser Phe Ile Thr Ala Ala Glu Asn Gly Lys
 1 5 10 15

Asn Tyr Glu Leu Leu Arg Asn Ser Gly Gly Gly Gln Ala Tyr Ser Arg
 20 25 30

Arg Ser Ala
 35

<210> 58

<211> 35

<212> PRT

<213> Haemophilus influenzae

<400> 58

Ala Tyr Ser Arg Arg Ser Ala Thr Pro Glu Asp Ile Asp Leu Asp Arg
 1 5 10 15

Lys Thr Gly Leu Thr Ser Glu Phe Thr Val Asn Phe Gly Thr Lys Lys
 20 25 30

Leu Thr Gly
 35

<210> 59

<211> 35

<212> PRT

<213> Haemophilus influenzae

<400> 59

Gly Thr Lys Lys Leu Thr Gly Gly Leu Tyr Tyr Asn Leu Arg Glu Thr
 1 5 10 15

Asp Ala Asn Lys Ser Gln Asn Arg Thr His Lys Leu Tyr Asp Leu Glu
 20 25 30

Ala Asp Val
 35

<210> 60
 <211> 35
 <212> PRT
 <213> Haemophilus influenzae

<400> 60
 Tyr Asp Leu Glu Ala Asp Val His Ser Asn Arg Phe Arg Gly Lys Val
 1 5 10 15
 Lys Pro Thr Lys Lys Glu Ser Ser Glu Glu His Pro Phe Thr Ser Glu
 20 25 30
 Gly Thr Leu
 35

<210> 61
 <211> 35
 <212> PRT
 <213> Haemophilus influenzae

<400> 61
 Phe Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Glu Gly
 1 5 10 15
 Gln Glu Leu Gly Gly Lys Phe Leu Ala His Asp Lys Lys Val Leu Gly
 20 25 30
 Val Phe Ser
 35

<210> 62
 <211> 35
 <212> PRT
 <213> Haemophilus influenzae

<400> 62
 Lys Val Leu Gly Val Phe Ser Ala Lys Glu Gln Gln Glu Thr Ser Glu
 1 5 10 15
 Asn Lys Lys Leu Pro Lys Glu Thr Leu Ile Asp Gly Lys Leu Thr Thr
 20 25 30
 Phe Lys Thr
 35

<210> 63
 <211> 35
 <212> PRT
 <213> Haemophilus influenzae

<400> 63
 Lys Leu Thr Thr Phe Lys Thr Thr Asn Ala Thr Ala Asn Ala Thr Thr
 1 5 10 15
 Asp Ala Thr Thr Ser Thr Thr Ala Ser Thr Lys Thr Asp Thr Thr Thr

20

25

30

Asn Ala Thr
35

<210> 64

<211> 35

<212> PRT

<213> Haemophilus influenzae

<400> 64

Asp Thr Thr Thr Asn Ala Thr Ala Asn Thr Glu Asn Phe Thr Thr Lys
1 5 10 15

Asp Ile Pro Ser Leu Gly Glu Ala Asp Tyr Leu Leu Ile Asp Asn Tyr
20 25 30

Pro Val Pro
35

<210> 65

<211> 35

<212> PRT

<213> Haemophilus influenzae

<400> 65

Ile Asp Asn Tyr Pro Val Pro Leu Phe Pro Glu Ser Gly Asp Phe Ile
1 5 10 15

Ser Ser Lys His His Thr Val Gly Lys Lys Thr Tyr Gln Val Glu Ala
20 25 30

Cys Cys Ser
35

<210> 66

<211> 36

<212> PRT

<213> Haemophilus influenzae

<400> 66

Cys Ser Asn Leu Ser Tyr Val Lys Phe Gly Met Tyr Tyr Glu Ala Pro
1 5 10 15

Pro Lys Glu Glu Glu Lys Glu Lys Glu Lys Asp Lys Asp Lys Glu Lys
20 25 30

Glu Lys Gln Ala
35

<210> 67

<211> 35

<212> PRT

<213> Haemophilus influenzae

<400> 67

Lys Glu Lys Asp Lys Asp Lys Glu Lys Glu Lys Gln Ala Thr Thr Ser
 1 5 10 15

Ile Lys Thr Tyr Tyr Gln Phe Leu Leu Gly Leu Arg Thr Pro Ser Ser
 20 25 30

Glu Ile Pro
 35

<210> 68

<211> 35

<212> PRT

<213> Haemophilus influenzae

<400> 68

Thr Pro Ser Ser Glu Ile Pro Lys Glu Gly Ser Ala Lys Tyr His Gly
 1 5 10 15

Asn Trp Phe Gly Tyr Ile Ser Asp Gly Glu Thr Ser Tyr Ser Ala Ser
 20 25 30

Gly Asp Lys
 35

<210> 69

<211> 35

<212> PRT

<213> Haemophilus influenzae

<400> 69

Tyr Ser Ala Ser Gly Asp Lys Glu Arg Ser Lys Asn Ala Val Ala Glu
 1 5 10 15

Phe Asn Val Asn Phe Ala Glu Lys Thr Leu Thr Gly Glu Leu Lys Arg
 20 25 30

His Asp Thr
 35

<210> 70

<211> 35

<212> PRT

<213> Haemophilus influenzae

<400> 70

Glu Leu Lys Arg His Asp Thr Gln Asn Pro Val Phe Lys Ile Asn Ala
 1 5 10 15

Thr Phe Gln Ser Gly Lys Asn Asp Phe Thr Gly Thr Ala Thr Ala Lys
 20 25 30

Asp Leu Ala
 35

<210> 71
 <211> 35
 <212> PRT
 <213> Haemophilus influenzae

<400> 71
 Ala Thr Ala Lys Asp Leu Ala Ile Asp Gly Lys Asn Thr Gln Gly Thr
 1 5 10 15
 Ser Lys Val Asn Phe Thr Ala Thr Val Asn Gly Ala Phe Tyr Gly Pro
 20 25 30
 His Ala Thr
 35

<210> 72
 <211> 26
 <212> PRT
 <213> Haemophilus influenzae

<400> 72
 Phe Tyr Gly Pro His Ala Thr Glu Leu Gly Gly Tyr Phe Thr Tyr Asn
 1 5 10 15
 Gly Asn Asn Pro Thr Asp Lys Asn Ser Ser
 20 25

<210> 73
 <211> 31
 <212> PRT
 <213> Haemophilus influenzae

<400> 73
 Cys Pro Thr Asp Lys Asn Ser Ser Ser Asn Ser Glu Lys Ala Arg Ala
 1 5 10 15
 Ala Val Val Phe Gly Ala Lys Lys Gln Gln Val Glu Thr Thr Lys
 20 25 30

<210> 74
 <211> 8
 <212> PRT
 <213> Haemophilus influenzae

<400> 74
 Leu Glu Gly Gly Phe Tyr Gly Pro
 1 5

<210> 75
 <211> 8
 <212> PRT
 <213> Haemophilus influenzae

<400> 75
 Cys Ser Gly Gly Gly Ser Phe Asp

1

5

<210> 76
 <211> 6
 <212> PRT
 <213> Haemophilus influenzae

<400> 76
 Tyr Val Tyr Ser Gly Leu
 1 5

<210> 77
 <211> 11
 <212> PRT
 <213> Haemophilus influenzae

<400> 77
 Cys Cys Ser Asn Leu Ser Tyr Val Lys Phe Gly
 1 5 10

<210> 78
 <211> 7
 <212> PRT
 <213> Haemophilus influenzae

<400> 78
 Phe Leu Leu Gly His Arg Thr
 1 5

<210> 79
 <211> 6
 <212> PRT
 <213> Haemophilus influenzae

<400> 79
 Glu Phe Asn Val Asp Phe
 1 5

<210> 80
 <211> 7
 <212> PRT
 <213> Haemophilus influenzae

<400> 80
 Asn Ala Phe Thr Gly Thr Ala
 1 5

<210> 81
 <211> 7
 <212> PRT
 <213> Haemophilus influenzae

<400> 81

Val Asn Gly Ala Phe Tyr Gly
1 5

<210> 82
<211> 6
<212> PRT
<213> Haemophilus influenzae

<400> 82
Glu Leu Gly Gly Tyr Phe
1 5

<210> 83
<211> 6
<212> PRT
<213> Haemophilus influenzae

<400> 83
Val Val Phe Gly Ala Arg
1 5

<210> 84
<211> 6
<212> PRT
<213> Haemophilus influenzae

<400> 84
Val Val Phe Gly Ala Lys
1 5

<210> 85
<211> 7
<212> PRT
<213> Haemophilus influenzae

<400> 85
Leu Glu Gly Gly Phe Tyr Gly
1 5

<210> 86
<211> 103
<212> DNA
<213> Haemophilus influenzae

<400> 86
tatggaaact caaagtataa aagatacaaa agaagctata tcattctgaag tggacactca 60
aagtacagaa gattcagaat tagaaactat ctcagtcact gca 103

<210> 87
<211> 97
<212> DNA
<213> Haemophilus influenzae

<400> 87
 acctttgagt ttcataat tttt ctatgttttc ttcgatata tagacttcac ctgtgagttt 60
 catgtcttct aagtcttaat ctttgataga gtcagt 97

<210> 88
 <211> 115
 <212> DNA
 <213> Haemophilus influenzae

<400> 88
 tatgaaagct actaaactgg ttctgggtgc tggtatcctg gggtccactc tgctggctgg 60
 ttgtagcgga ggtggttgtt ttgatgtaga taacgtctct aataccccct cttct 115

<210> 89
 <211> 116
 <212> DNA
 <213> Haemophilus influenzae

<400> 89
 acttttcgatg atttgaccaa gacccacgac aataggaccc aaggtgagac gaccgaccaa 60
 catgcctcc accaacaata ctacatctat tgcagagatt atgggggaga agattt 116

<210> 90
 <211> 109
 <212> DNA
 <213> Haemophilus influenzae

<400> 90
 tatgcatat ctggcaacat tggtgttatt tctggcggtg ttaatcaccg ctggtttag 60
 cggaggtggt tcttttgatg tagataacgt ctctaatacc ccctcttct 109

<210> 91
 <211> 110
 <212> DNA
 <213> Haemophilus influenzae

<400> 91
 acgctataga ccgttgtaac aacaatagag accgccacaa ttagtggcga ccaacatcgc 60
 ctccaccaag aaaactacat ctattgcaga gattatgggg gagaagattt 110

<210> 92
 <211> 117
 <212> DNA
 <213> Haemophilus influenzae

<400> 92
 tatgcaactg aacaaagtgc tgaaagggct gatgattgct ctgcctgtta tggcaatgct 60
 ggttgtagcg gaggtggttc ttttgatgta gataacgtct ctaatacccc ctcttct 117

<210> 93
 <211> 119
 <212> DNA
 <213> Haemophilus influenzae

<400> 93

acgttgactt gtttcacgac tttcccgact actaacgaga cggacaatac cgtaaacgac 60
 caacatcgcc tccaccaaga aaactacatc tattgcagag attatggggg agaagattt 119

<210> 94

<211> 908

<212> PRT

<213> Haemophilus influenzae

<400> 94

Met Gln Gln Gln His Leu Phe Arg Leu Asn Ile Leu Cys Leu Ser Leu
 1 5 10 15

Met Thr Ala Leu Pro Val Tyr Ala Glu Asn Val Gln Ala Glu Gln Ala
 20 25 30

Gln Glu Lys Gln Leu Asp Thr Ile Gln Val Lys Ala Lys Lys Gln Lys
 35 40 45

Thr Arg Arg Asp Asn Glu Val Thr Gly Leu Gly Lys Leu Val Lys Ser
 50 55 60

Ser Asp Thr Leu Ser Lys Glu Gln Val Leu Asn Ile Arg Asp Leu Thr
 65 70 75 80

Arg Tyr Asp Pro Gly Ile Ala Val Val Glu Gln Gly Arg Gly Ala Ser
 85 90 95

Ser Gly Tyr Ser Ile Arg Gly Met Asp Lys Asn Arg Val Ser Leu Thr
 100 105 110

Val Asp Gly Val Ser Gln Ile Gln Ser Tyr Thr Ala Gln Ala Ala Leu
 115 120 125

Gly Gly Thr Arg Thr Ala Gly Ser Ser Gly Ala Ile Asn Glu Ile Glu
 130 135 140

Tyr Glu Asn Val Lys Ala Val Glu Ile Ser Lys Gly Ser Asn Ser Ser
 145 150 155 160

Glu Tyr Gly Asn Gly Ala Leu Ala Gly Ser Val Ala Phe Gln Thr Lys
 165 170 175

Thr Ala Ala Asp Ile Ile Gly Glu Gly Lys Gln Trp Gly Ile Gln Ser
 180 185 190

Lys Thr Ala Tyr Ser Gly Lys Asp His Ala Leu Thr Gln Ser Leu Ala
 195 200 205

Leu Ala Gly Arg Ser Gly Gly Ala Glu Ala Leu Leu Ile Tyr Thr Lys
 210 215 220

Arg Arg Gly Arg Glu Ile His Ala His Lys Asp Ala Gly Lys Gly Val
 225 230 235 240

Gln Ser Phe Asn Arg Leu Val Leu Asp Glu Asp Lys Lys Glu Gly Gly
 245 250 255

Ser Gln Tyr Arg Tyr Phe Ile Val Glu Glu Glu Cys His Asn Gly Tyr
 260 265 270
 Ala Ala Cys Lys Asn Lys Leu Lys Glu Asp Ala Ser Val Lys Asp Glu
 275 280 285
 Arg Lys Thr Val Ser Thr Gln Asp Tyr Thr Gly Ser Asn Arg Leu Leu
 290 295 300
 Ala Asn Pro Leu Glu Tyr Gly Ser Gln Ser Trp Leu Phe Arg Pro Gly
 305 310 315 320
 Trp His Leu Asp Asn Arg His Tyr Val Gly Ala Val Leu Glu Arg Thr
 325 330 335
 Gln Gln Thr Phe Asp Thr Arg Asp Met Thr Val Pro Ala Tyr Phe Thr
 340 345 350
 Ser Glu Asp Tyr Val Pro Gly Ser Leu Lys Gly Leu Gly Lys Tyr Ser
 355 360 365
 Gly Asp Asn Lys Ala Glu Arg Leu Phe Val Gln Gly Glu Gly Ser Thr
 370 375 380
 Leu Gln Gly Ile Gly Tyr Gly Thr Gly Val Phe Tyr Asp Glu Arg His
 385 390 395 400
 Thr Lys Asn Arg Tyr Gly Val Glu Tyr Val Tyr His Asn Ala Asp Lys
 405 410 415
 Asp Thr Trp Ala Asp Tyr Ala Arg Leu Ser Tyr Asp Arg Gln Gly Ile
 420 425 430
 Asp Leu Asp Asn Arg Leu Gln Gln Thr His Cys Ser His Asp Gly Ser
 435 440 445
 Asp Lys Asn Cys Arg Pro Asp Gly Asn Lys Pro Tyr Ser Phe Tyr Lys
 450 455 460
 Ser Asp Arg Met Ile Tyr Glu Glu Ser Arg Asn Leu Phe Gln Ala Val
 465 470 475 480
 Phe Lys Lys Ala Phe Asp Thr Ala Lys Ile Arg His Asn Leu Ser Ile
 485 490 495
 Asn Leu Gly Tyr Asp Arg Phe Lys Ser Gln Leu Ser His Ser Asp Tyr
 500 505 510
 Tyr Leu Gln Asn Ala Val Gln Ala Tyr Asp Leu Ile Thr Pro Lys Lys
 515 520 525
 Pro Pro Phe Pro Asn Gly Ser Lys Asp Asn Pro Tyr Arg Val Ser Ile
 530 535 540
 Gly Lys Thr Thr Val Asn Thr Ser Pro Ile Cys Arg Phe Gly Asn Asn
 545 550 555 560
 Thr Tyr Thr Asp Cys Thr Pro Arg Asn Ile Gly Gly Asn Gly Tyr Tyr

575

Tyr Arg Tyr Val Thr Trp Glu Asn Val Arg Gln Thr Ala Gly Gly Ala
865 870 875 880

Val Asn Gln His Lys Asn Val Gly Val Tyr Asn Arg Tyr Ala Ala Pro
 885 890 895

Gly Arg Asn Tyr Thr Phe Ser Leu Glu Met Lys Phe
 900 905

<210> 95

<211> 911

<212> PRT

<213> Haemophilus influenzae

<400> 95

Met Gln Gln Gln His Leu Phe Arg Leu Asn Ile Leu Cys Leu Ser Leu
 1 5 10 15

Met Thr Ala Leu Pro Ala Tyr Ala Glu Asn Val Gln Ala Gly Gln Ala
 20 25 30

Gln Glu Lys Gln Leu Asp Thr Ile Gln Val Lys Ala Lys Lys Gln Lys
 35 40 45

Thr Arg Arg Asp Asn Glu Val Thr Gly Leu Gly Lys Leu Val Lys Thr
 50 55 60

Ala Asp Thr Leu Ser Lys Glu Gln Val Leu Asp Ile Arg Asp Leu Thr
 65 70 75 80

Arg Tyr Asp Pro Gly Ile Ala Val Val Glu Gln Gly Arg Gly Ala Ser
 85 90 95

Ser Gly Tyr Ser Ile Arg Gly Met Asp Lys Asn Arg Val Ser Leu Thr
 100 105 110

Val Asp Gly Leu Ala Gln Ile Gln Ser Tyr Thr Ala Gln Ala Ala Leu
 115 120 125

Gly Gly Thr Arg Thr Ala Gly Ser Ser Gly Ala Ile Asn Glu Ile Glu
 130 135 140

Tyr Glu Asn Val Lys Ala Val Glu Ile Ser Lys Gly Ser Asn Ser Val
 145 150 155 160

Glu Gln Gly Ser Gly Ala Leu Ala Gly Ser Val Ala Phe Gln Thr Lys
 165 170 175

Thr Ala Asp Asp Val Ile Gly Glu Gly Arg Gln Trp Gly Ile Gln Ser
 180 185 190

Lys Thr Ala Tyr Ser Gly Lys Asn Arg Gly Leu Thr Gln Ser Ile Ala
 195 200 205

Leu Ala Gly Arg Ile Gly Gly Ala Glu Ala Leu Leu Ile His Thr Gly
 210 215 220

Arg Arg Ala Gly Glu Ile Arg Ala His Glu Asp Ala Gly Arg Gly Val
 225 230 235 240

Gln Ser Phe Asn Arg Leu Val Pro Val Glu Asp Ser Ser Glu Tyr Ala

245 250 255
 Tyr Phe Ile Val Glu Asp Glu Cys Glu Gly Lys Asn Tyr Glu Thr Cys
 260 265 270
 Lys Ser Lys Pro Lys Lys Asp Val Val Gly Lys Asp Glu Arg Gln Thr
 275 280 285
 Val Ser Thr Arg Asp Tyr Thr Gly Pro Asn Arg Phe Leu Ala Asp Pro
 290 295 300
 Leu Ser Tyr Glu Ser Arg Ser Trp Leu Phe Arg Pro Gly Phe Arg Phe
 305 310 315 320
 Glu Asn Lys Arg His Tyr Ile Gly Gly Ile Leu Glu His Thr Gln Gln
 325 330 335
 Thr Phe Asp Thr Arg Asp Met Thr Val Pro Ala Phe Leu Thr Lys Ala
 340 345 350
 Val Phe Asp Ala Asn Ser Lys Gln Ala Gly Ser Leu Pro Gly Asn Gly
 355 360 365
 Lys Tyr Ala Gly Asn His Lys Tyr Gly Gly Leu Phe Thr Asn Gly Glu
 370 375 380
 Asn Gly Ala Leu Val Gly Ala Glu Tyr Gly Thr Gly Val Phe Tyr Asp
 385 390 395 400
 Glu Thr His Thr Lys Ser Arg Tyr Gly Leu Glu Tyr Val Tyr Thr Asn
 405 410 415
 Ala Asp Lys Asp Thr Trp Ala Asp Tyr Ala Arg Leu Ser Tyr Asp Arg
 420 425 430
 Gln Gly Ile Gly Leu Asp Asn His Phe Gln Gln Thr His Cys Ser Ala
 435 440 445
 Asp Gly Ser Asp Lys Tyr Cys Arg Pro Ser Ala Asp Lys Pro Phe Ser
 450 455 460
 Tyr Tyr Lys Ser Asp Arg Val Ile Tyr Gly Glu Ser His Arg Leu Leu
 465 470 475 480
 Gln Ala Ala Phe Lys Lys Ser Phe Asp Thr Ala Lys Ile Arg His Asn
 485 490 495
 Leu Ser Val Asn Leu Gly Phe Asp Arg Phe Asp Ser Asn Leu Arg His
 500 505 510
 Gln Asp Tyr Tyr Tyr Gln His Ala Asn Arg Ala Tyr Ser Ser Lys Thr
 515 520 525
 Pro Pro Lys Thr Ala Asn Pro Asn Gly Asp Lys Ser Lys Pro Tyr Trp
 530 535 540
 Val Ser Ile Gly Gly Gly Asn Val Val Thr Gly Gln Ile Cys Leu Phe
 545 550 555 560

Gly Asn Asn Thr Tyr Thr Asp Cys Thr Pro Arg Ser Ile Asn Gly Lys
 565 570 575
 Ser Tyr Tyr Ala Ala Val Arg Asp Asn Val Arg Leu Gly Arg Trp Ala
 580 585 590
 Asp Val Gly Ala Gly Leu Arg Tyr Asp Tyr Arg Ser Thr His Ser Asp
 595 600 605
 Asp Gly Ser Val Ser Thr Gly Thr His Arg Thr Leu Ser Trp Asn Ala
 610 615 620
 Gly Ile Val Leu Lys Pro Ala Asp Trp Leu Asp Leu Thr Tyr Arg Thr
 625 630 635 640
 Ser Thr Gly Phe Arg Leu Pro Ser Phe Ala Glu Met Tyr Gly Trp Arg
 645 650 655
 Ser Gly Val Gln Ser Lys Ala Val Lys Ile Asp Pro Glu Lys Ser Phe
 660 665 670
 Asn Lys Glu Ala Gly Ile Val Phe Lys Gly Asp Phe Gly Asn Leu Glu
 675 680 685
 Ala Ser Trp Phe Asn Asn Ala Tyr Arg Asp Leu Ile Val Arg Gly Tyr
 690 695 700
 Glu Ala Gln Ile Lys Asn Gly Lys Glu Glu Ala Lys Gly Asp Pro Ala
 705 710 715 720
 Tyr Leu Asn Ala Gln Ser Ala Arg Ile Thr Gly Ile Asn Ile Leu Gly
 725 730 735
 Lys Ile Asp Trp Asn Gly Val Trp Asp Lys Leu Pro Glu Gly Trp Tyr
 740 745 750
 Ser Thr Phe Ala Tyr Asn Arg Val His Val Arg Asp Ile Lys Lys Arg
 755 760 765
 Ala Asp Arg Thr Asp Ile Gln Ser His Leu Phe Asp Ala Ile Gln Pro
 770 775 780
 Ser Arg Tyr Val Val Gly Leu Gly Tyr Asp Gln Pro Glu Gly Lys Trp
 785 790 795 800
 Gly Val Asn Gly Met Leu Thr Tyr Ser Lys Ala Lys Glu Ile Thr Glu
 805 810 815
 Leu Leu Gly Ser Arg Ala Leu Leu Asn Gly Asn Ser Arg Asn Thr Lys
 820 825 830
 Ala Thr Ala Arg Arg Thr Arg Pro Trp Tyr Ile Val Asp Val Ser Gly
 835 840 845
 Tyr Tyr Thr Ile Lys Lys His Phe Thr Leu Arg Ala Gly Val Tyr Asn
 850 855 860
 Leu Leu Asn Tyr Arg Tyr Val Thr Trp Glu Asn Val Arg Gln Thr Ala
 865 870 875 880

Gly Gly Ala Val Asn Gln His Lys Asn Val Gly Val Tyr Asn Arg Tyr
 885 890 895

Ala Ala Pro Gly Arg Asn Tyr Thr Phe Ser Leu Glu Met Lys Phe
 900 905 910

<210> 96

<211> 915

<212> PRT

<213> Haemophilus influenzae

<400> 96

Met Gln Gln Gln His Leu Phe Arg Leu Asn Ile Leu Cys Leu Ser Leu
 1 5 10 15

Met Thr Ala Leu Pro Ala Tyr Ala Glu Asn Val Gln Ala Gly Gln Ala
 20 25 30

Gln Glu Lys Gln Leu Asp Thr Ile Gln Val Lys Ala Lys Lys Gln Lys
 35 40 45

Thr Arg Arg Asp Asn Glu Val Thr Gly Leu Gly Lys Leu Val Lys Thr
 50 55 60

Ala Asp Thr Leu Ser Lys Glu Gln Val Leu Asp Ile Arg Asp Leu Thr
 65 70 75 80

Arg Tyr Asp Pro Gly Ile Ala Val Val Glu Gln Gly Arg Gly Ala Ser
 85 90 95

Ser Gly Tyr Ser Ile Arg Gly Met Asp Lys Asn Arg Val Ser Leu Thr
 100 105 110

Val Asp Gly Leu Ala Gln Ile Gln Ser Tyr Thr Ala Gln Ala Ala Leu
 115 120 125

Gly Gly Thr Arg Thr Ala Gly Ser Ser Gly Ala Ile Asn Glu Ile Glu
 130 135 140

Tyr Glu Asn Val Lys Ala Val Glu Ile Ser Lys Gly Ser Asn Ser Val
 145 150 155 160

Glu Gln Gly Ser Gly Ala Leu Ala Gly Ser Val Ala Phe Gln Thr Lys
 165 170 175

Thr Ala Asp Asp Val Ile Gly Glu Gly Arg Gln Trp Gly Ile Gln Ser
 180 185 190

Lys Thr Ala Tyr Ser Gly Lys Asn Arg Gly Leu Thr Gln Ser Ile Ala
 195 200 205

Leu Ala Gly Arg Ile Gly Gly Ala Glu Ala Leu Leu Ile Arg Thr Gly
 210 215 220

Arg His Ala Gly Glu Ile Arg Ala His Glu Ala Ala Gly Arg Gly Val
 225 230 235 240

B

Gln Ser Phe Asn Arg Leu Ala Pro Val Asp Asp Gly Ser Lys Tyr Ala
 245 250 255
 Tyr Phe Ile Val Glu Glu Glu Cys Lys Asn Gly Gly His Glu Lys Cys
 260 265 270
 Lys Ala Asn Pro Lys Lys Asp Val Val Gly Glu Asp Lys Arg Gln Thr
 275 280 285
 Val Ser Thr Arg Asp Tyr Thr Gly Pro Asn Arg Phe Leu Ala Asp Pro
 290 295 300
 Leu Ser Tyr Glu Ser Arg Ser Trp Leu Phe Arg Pro Gly Phe Arg Phe
 305 310 315 320
 Glu Asn Lys Arg His Tyr Ile Gly Gly Ile Leu Glu Arg Thr Gln Gln
 325 330 335
 Thr Phe Asp Thr Arg Asp Met Thr Val Pro Ala Phe Leu Thr Lys Ala
 340 345 350
 Val Phe Asp Ala Asn Gln Lys Gln Ala Gly Ser Leu Arg Gly Asn Gly
 355 360 365
 Lys Tyr Ala Gly Asn His Lys Tyr Gly Gly Leu Phe Thr Ser Gly Glu
 370 375 380
 Asn Asn Ala Pro Val Gly Ala Glu Tyr Gly Thr Gly Val Phe Tyr Asp
 385 390 395 400
 Glu Thr His Thr Lys Ser Arg Tyr Gly Leu Glu Tyr Val Tyr Thr Asn
 405 410 415
 Ala Asp Lys Asp Thr Trp Ala Asp Tyr Ala Arg Leu Ser Tyr Asp Arg
 420 425 430
 Gln Gly Ile Gly Leu Asp Asn His Phe Gln Gln Thr His Cys Ser Ala
 435 440 445
 Asp Gly Ser Asp Lys Tyr Cys Arg Pro Ser Ala Asp Lys Pro Phe Ser
 450 455 460
 Tyr Tyr Lys Ser Asp Arg Val Ile Tyr Gly Glu Ser His Lys Leu Leu
 465 470 475 480
 Gln Ala Ala Phe Lys Lys Ser Phe Asp Thr Ala Lys Ile Arg His Asn
 485 490 495
 Leu Ser Val Asn Leu Gly Tyr Asp Arg Phe Gly Ser Asn Leu Arg His
 500 505 510
 Gln Asp Tyr Tyr Tyr Gln Ser Ala Asn Arg Ala Tyr Ser Leu Lys Thr
 515 520 525
 Pro Pro Gln Asn Asn Gly Lys Lys Thr Ser Pro Asn Gly Arg Glu Lys
 530 535 540
 Asn Pro Tyr Trp Val Ser Ile Gly Arg Gly Asn Val Val Thr Arg Gln
 545 550 555 560

Ile Cys Leu Phe Gly Asn Asn Thr Tyr Thr Asp Cys Thr Pro Arg Ser
 565 570 575
 Ile Asn Gly Lys Ser Tyr Tyr Ala Ala Val Arg Asp Asn Val Arg Leu
 580 585 590
 Gly Arg Trp Ala Asp Val Gly Ala Gly Leu Arg Tyr Asp Tyr Arg Ser
 595 600 605
 Thr His Ser Asp Asp Gly Ser Val Ser Thr Gly Thr His Arg Thr Leu
 610 615 620
 Ser Trp Asn Ala Gly Ile Val Leu Lys Pro Ala Asp Trp Leu Asp Leu
 625 630 635 640
 Thr Tyr Arg Thr Ser Thr Gly Phe Arg Leu Pro Ser Phe Ala Glu Met
 645 650 655
 Tyr Gly Trp Arg Ser Gly Asp Lys Ile Lys Ala Val Lys Ile Asp Pro
 660 665 670
 Glu Lys Ser Phe Asn Lys Glu Ala Gly Ile Val Phe Lys Gly Asp Phe
 675 680 685
 Gly Asn Leu Glu Ala Ser Trp Phe Asn Asn Ala Tyr Arg Asp Leu Ile
 690 695 700
 Val Arg Gly Tyr Glu Ala Gln Ile Lys Asp Gly Lys Glu Gln Val Lys
 705 710 715 720
 Gly Asn Pro Ala Tyr Leu Asn Ala Gln Ser Ala Arg Ile Thr Gly Ile
 725 730 735
 Asn Ile Leu Gly Lys Ile Asp Trp Asn Gly Val Trp Asp Lys Leu Pro
 740 745 750
 Glu Gly Trp Tyr Ser Thr Phe Ala Tyr Asn Arg Val Arg Val Arg Asp
 755 760 765
 Ile Lys Lys Arg Ala Asp Arg Thr Asp Ile Gln Ser His Leu Phe Asp
 770 775 780
 Ala Ile Gln Pro Ser Arg Tyr Val Val Gly Ser Gly Tyr Asp Gln Pro
 785 790 795 800
 Glu Gly Lys Trp Gly Val Asn Gly Met Leu Thr Tyr Ser Lys Ala Lys
 805 810 815
 Glu Ile Thr Glu Leu Leu Gly Ser Arg Ala Leu Leu Asn Gly Asn Ser
 820 825 830
 Arg Asn Thr Lys Ala Thr Ala Arg Arg Thr Arg Pro Trp Tyr Ile Val
 835 840 845
 Asp Val Ser Gly Tyr Tyr Thr Val Lys Lys His Phe Thr Leu Arg Ala
 850 855 860
 Gly Val Tyr Asn Leu Leu Asn His Arg Tyr Val Thr Trp Glu Asn Val

865 870 875 880

Arg Gln Thr Ala Ala Gly Ala Val Asn Gln His Lys Asn Val Gly Val
 885 890 895

Tyr Asn Arg Tyr Ala Ala Pro Gly Arg Asn Tyr Thr Phe Ser Leu Glu
 900 905 910

Met Lys Phe
 915

<210> 97
 <211> 598
 <212> PRT
 <213> Haemophilus influenzae

<400> 97
 Met Asn Asn Pro Leu Val Asn Gln Ala Ala Met Val Leu Pro Val Phe
 1 5 10 15

Leu Leu Ser Ala Cys Leu Gly Gly Gly Gly Ser Phe Asp Leu Asp Ser
 20 25 30

Val Glu Thr Val Gln Asp Met His Ser Lys Pro Lys Tyr Glu Asp Glu
 35 40 45

Lys Ser Gln Pro Glu Ser Gln Gln Asp Val Ser Glu Asn Ser Gly Ala
 50 55 60

Ala Tyr Gly Phe Ala Val Lys Leu Pro Arg Arg Asn Ala His Phe Asn
 65 70 75 80

Pro Lys Tyr Lys Glu Lys His Lys Pro Leu Gly Ser Met Asp Trp Lys
 85 90 95

Lys Leu Gln Arg Gly Glu Pro Asn Ser Phe Ser Glu Arg Asp Glu Leu
 100 105 110

Glu Lys Lys Arg Gly Ser Ser Glu Leu Ile Glu Ser Lys Trp Glu Asp
 115 120 125

Gly Gln Ser Arg Val Val Gly Tyr Thr Asn Phe Thr Tyr Val Arg Ser
 130 135 140

Gly Tyr Val Tyr Leu Asn Lys Asn Asn Ile Asp Ile Lys Asn Asn Ile
 145 150 155 160

Val Leu Phe Gly Pro Asp Gly Tyr Leu Tyr Tyr Lys Gly Lys Glu Pro
 165 170 175

Ser Lys Glu Leu Pro Ser Glu Lys Ile Thr Tyr Lys Gly Thr Trp Asp
 180 185 190

Tyr Val Thr Asp Ala Met Glu Lys Gln Arg Phe Glu Gly Leu Gly Ser
 195 200 205

Ala Ala Gly Gly Asp Lys Ser Gly Ala Leu Ser Ala Leu Glu Glu Gly
 210 215 220

Val Leu Arg Asn Gln Ala Glu Ala Ser Ser Gly His Thr Asp Phe Gly
 225 230 235 240
 Met Thr Ser Glu Phe Glu Val Asp Phe Ser Asp Lys Thr Ile Lys Gly
 245 250 255
 Thr Leu Tyr Arg Asn Asn Arg Ile Thr Gln Asn Asn Ser Glu Asn Lys
 260 265 270
 Gln Ile Lys Thr Thr Arg Tyr Thr Ile Gln Ala Thr Leu His Gly Asn
 275 280 285
 Arg Phe Lys Gly Lys Ala Leu Ala Ala Asp Lys Gly Ala Thr Asn Gly
 290 295 300
 Ser His Pro Phe Ile Ser Asp Ser Asp Ser Leu Glu Gly Gly Phe Tyr
 305 310 315 320
 Gly Pro Lys Gly Glu Glu Leu Ala Gly Lys Phe Leu Ser Asn Asp Asn
 325 330 335
 Lys Val Ala Ala Val Phe Gly Ala Lys Gln Lys Asp Lys Lys Asp Gly
 340 345 350
 Glu Asn Ala Ala Gly Pro Ala Thr Glu Val Ile Asp Ala Tyr Arg Ile
 355 360 365
 Thr Gly Glu Glu Phe Lys Lys Glu Gln Ile Asp Ser Phe Gly Asp Val
 370 375 380
 Lys Lys Leu Leu Val Asp Gly Val Glu Leu Ser Leu Leu Pro Ser Glu
 385 390 395 400
 Gly Asn Lys Ala Ala Phe Gln His Glu Ile Glu Gln Asn Gly Val Lys
 405 410 415
 Ala Thr Val Cys Cys Ser Asn Leu Asp Tyr Met Ser Phe Gly Lys Leu
 420 425 430
 Ser Lys Glu Asn Lys Asp Asp Met Phe Leu Gln Gly Val Arg Thr Pro
 435 440 445
 Val Ser Asp Val Ala Ala Arg Thr Glu Ala Asn Ala Lys Tyr Arg Gly
 450 455 460
 Thr Trp Tyr Gly Tyr Ile Ala Asn Gly Thr Ser Trp Ser Gly Glu Ala
 465 470 475 480
 Ser Asn Gln Glu Gly Gly Asn Arg Ala Glu Phe Asp Val Asp Phe Ser
 485 490 495
 Thr Lys Lys Ile Ser Gly Thr Leu Thr Ala Lys Asp Arg Thr Ser Pro
 500 505 510
 Ala Phe Thr Ile Thr Ala Met Ile Lys Asp Asn Gly Phe Ser Gly Val
 515 520 525
 Ala Lys Thr Gly Glu Asn Gly Phe Ala Leu Asp Pro Gln Asn Thr Gly

530 535 540
 Asn Ser His Tyr Thr His Ile Glu Ala Thr Val Ser Gly Gly Phe Tyr
 545 550 555 560
 Gly Lys Asn Ala Ile Glu Met Gly Gly Ser Phe Ser Phe Pro Gly Asn
 565 570 575
 Ala Pro Glu Gly Lys Gln Glu Lys Ala Ser Val Val Phe Gly Ala Lys
 580 585 590
 Arg Gln Gln Leu Val Gln
 595

 <210> 98
 <211> 711
 <212> PRT
 <213> Haemophilus influenzae

 <400> 98
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 Leu Leu Ser Ala Cys Leu Gly Gly Gly Gly Ser Phe Asp Leu Asp Ser
 20 25 30
 Val Asp Thr Glu Ala Pro Arg Pro Ala Pro Lys Tyr Gln Asp Val Ser
 35 40 45
 Ser Glu Lys Pro Gln Ala Gln Lys Asp Gln Gly Gly Tyr Gly Phe Ala
 50 55 60
 Met Arg Leu Lys Arg Arg Asn Trp Tyr Pro Gly Ala Glu Glu Ser Glu
 65 70 75 80
 Val Lys Leu Asn Glu Ser Asp Trp Glu Ala Thr Gly Leu Pro Thr Lys
 85 90 95
 Pro Lys Glu Leu Pro Lys Arg Gln Lys Ser Val Ile Glu Lys Val Glu
 100 105 110
 Thr Asp Gly Asp Ser Asp Ile Tyr Ser Ser Pro Tyr Leu Thr Pro Ser
 115 120 125
 Asn His Gln Asn Gly Ser Ala Gly Asn Gly Val Asn Gln Pro Lys Asn
 130 135 140
 Gln Ala Thr Gly His Glu Asn Phe Gln Tyr Val Tyr Ser Gly Trp Phe
 145 150 155 160
 Tyr Lys His Ala Ala Ser Glu Lys Asp Phe Ser Asn Lys Lys Ile Lys
 165 170 175
 Ser Gly Asp Asp Gly Tyr Ile Phe Tyr His Gly Glu Lys Pro Ser Arg
 180 185 190
 Gln Leu Pro Ala Ser Gly Lys Val Ile Tyr Lys Gly Val Trp His Phe
 195 200 205

Val Thr Asp Thr Lys Lys Gly Gln Asp Phe Arg Glu Ile Ile Gln Pro
 210 215 220
 Ser Lys Lys Gln Gly Asp Arg Tyr Ser Gly Phe Ser Gly Asp Gly Ser
 225 230 235 240
 Glu Glu Tyr Ser Asn Lys Asn Glu Ser Thr Leu Lys Asp Asp His Glu
 245 250 255
 Gly Tyr Gly Phe Thr Ser Asn Leu Glu Val Asp Phe Gly Asn Lys Lys
 260 265 270
 Leu Thr Gly Lys Leu Ile Arg Asn Asn Ala Ser Leu Asn Asn Asn Thr
 275 280 285
 Asn Asn Asp Lys His Thr Thr Gln Tyr Tyr Ser Leu Asp Ala Gln Ile
 290 295 300
 Thr Gly Asn Arg Phe Asn Gly Thr Ala Thr Ala Thr Asp Lys Lys Glu
 305 310 315 320
 Asn Glu Thr Lys Leu His Pro Phe Val Ser Asp Ser Ser Ser Leu Ser
 325 330 335
 Gly Gly Phe Phe Gly Pro Gln Gly Glu Glu Leu Gly Phe Arg Phe Leu
 340 345 350
 Ser Asp Asp Gln Lys Val Ala Val Val Gly Ser Ala Lys Thr Lys Asp
 355 360 365
 Lys Leu Glu Asn Gly Ala Ala Ala Ser Gly Ser Thr Gly Ala Ala Ala
 370 375 380
 Ser Gly Gly Ala Ala Gly Thr Ser Ser Glu Asn Ser Lys Leu Thr Thr
 385 390 395 400
 Val Leu Asp Ala Val Glu Leu Thr Leu Asn Asp Lys Lys Ile Lys Asn
 405 410 415
 Leu Asp Asn Phe Ser Asn Ala Ala Gln Leu Val Val Asp Gly Ile Met
 420 425 430
 Ile Pro Leu Leu Pro Lys Asp Ser Glu Ser Gly Asn Thr Gln Ala Asp
 435 440 445
 Lys Gly Lys Asn Gly Gly Thr Glu Phe Thr Arg Lys Phe Glu His Thr
 450 455 460
 Pro Glu Ser Asp Lys Lys Asp Ala Gln Ala Gly Thr Gln Thr Asn Gly
 465 470 475 480
 Ala Gln Thr Ala Ser Asn Thr Ala Gly Asp Thr Asn Gly Lys Thr Lys
 485 490 495
 Thr Tyr Glu Val Glu Val Cys Cys Ser Asn Leu Asn Tyr Leu Lys Tyr
 500 505 510
 Gly Met Leu Thr Arg Lys Asn Ser Lys Ser Ala Met Gln Ala Gly Gly

515 520 525
 Asn Ser Ser Gln Ala Asp Ala Lys Thr Glu Gln Val Glu Gln Ser Met
 530 535 540
 Phe Leu Gln Gly Glu Arg Thr Asp Glu Lys Glu Ile Pro Thr Asp Gln
 545 550 555 560
 Asn Val Val Tyr Arg Gly Ser Trp Tyr Gly His Ile Ala Asn Gly Thr
 565 570 575
 Ser Trp Ser Gly Asn Ala Ser Asp Lys Glu Gly Gly Asn Arg Ala Glu
 580 585 590
 Phe Thr Val Asn Phe Ala Asp Lys Lys Ile Thr Gly Lys Leu Thr Ala
 595 600 605
 Glu Asn Arg Gln Ala Gln Thr Phe Thr Ile Glu Gly Met Ile Gln Gly
 610 615 620
 Asn Gly Phe Glu Gly Thr Ala Lys Thr Ala Glu Ser Gly Phe Asp Leu
 625 630 635 640
 Asp Gln Lys Asn Thr Thr Arg Thr Pro Lys Ala Tyr Ile Thr Asp Ala
 645 650 655
 Lys Val Lys Gly Gly Phe Tyr Gly Pro Lys Ala Glu Glu Leu Gly Gly
 660 665 670
 Trp Phe Ala Tyr Pro Gly Asp Lys Gln Thr Glu Lys Ala Thr Ala Thr
 675 680 685
 Ser Ser Asp Gly Asn Ser Ala Ser Ser Ala Thr Val Val Phe Gly Ala
 690 695 700
 Lys Arg Gln Gln Pro Val Gln
 705 710

<210> 99
 <211> 546
 <212> PRT
 <213> Haemophilus influenzae

<400> 99
 Met His Phe Lys Leu Asn Pro Tyr Ala Leu Ala Phe Thr Ser Leu Phe
 1 5 10 15
 Leu Val Ala Cys Ser Gly Gly Lys Gly Ser Phe Asp Leu Glu Asp Val
 20 25 30
 Arg Pro Asn Lys Thr Thr Gly Val Ser Lys Glu Glu Tyr Lys Asp Val
 35 40 45
 Glu Thr Ala Lys Lys Glu Lys Glu Gln Leu Gly Glu Leu Met Glu Pro
 50 55 60
 Ala Leu Gly Tyr Val Val Lys Val Pro Val Ser Ser Phe Glu Asn Lys
 65 70 75 80

Lys Val Asp Ile Ser Asp Ile Glu Val Ile Thr Asn Gly Asn Leu Asp
 85 90 95
 Asp Val Pro Tyr Lys Ala Asn Ser Ser Lys Tyr Asn Tyr Pro Asp Ile
 100 105 110
 Lys Thr Lys Asp Ser Ser Leu Gln Tyr Val Arg Ser Gly Tyr Val Ile
 115 120 125
 Asp Gly Glu His Ser Gly Ser Asn Glu Lys Gly Tyr Val Tyr Tyr Lys
 130 135 140
 Gly Asn Ser Pro Ala Lys Glu Leu Pro Val Asn Gln Leu Leu Thr Tyr
 145 150 155 160
 Thr Gly Ser Trp Asp Phe Thr Ser Asn Ala Asn Leu Asn Asn Glu Glu
 165 170 175
 Gly Arg Pro Asn Tyr Leu Asn Asp Asp Tyr Tyr Thr Lys Phe Ile Gly
 180 185 190
 Lys Arg Val Gly Leu Val Ser Gly Asp Ala Lys Pro Ala Lys His Lys
 195 200 205
 Tyr Thr Ser Gln Phe Glu Val Asp Phe Ala Thr Lys Lys Met Thr Gly
 210 215 220
 Lys Ser Asp Lys Glu Lys Thr Ile Tyr Thr Val Asn Ala Asp Ile Arg
 225 230 235 240
 Gly Asn Arg Phe Thr Gly Ala Ala Thr Ala Ser Asp Lys Asn Lys Gly
 245 250 255
 Lys Gly Glu Ser Tyr Asn Phe Phe Ser Ala Asp Ser Gln Ser Leu Glu
 260 265 270
 Gly Gly Phe Tyr Gly Pro Lys Ala Glu Glu Met Ala Gly Lys Phe Val
 275 280 285
 Ala Asn Asp Lys Ser Leu Phe Ala Val Phe Ser Ala Lys His Asn Gly
 290 295 300
 Ser Asn Val Asn Thr Val Arg Ile Ile Asp Ala Ser Lys Ile Asp Leu
 305 310 315 320
 Thr Asn Phe Ser Ile Ser Glu Leu Asn Asn Phe Gly Asp Ala Ser Val
 325 330 335
 Leu Ile Ile Asp Gly Lys Lys Ile Lys Leu Ala Gly Ser Gly Phe Thr
 340 345 350
 Asn Lys His Thr Ile Glu Ile Asn Gly Lys Thr Met Val Ala Val Ala
 355 360 365
 Cys Cys Ser Asn Leu Glu Tyr Met Lys Phe Gly Gln Leu Trp Gln Gln
 370 375 380
 Ala Glu Gly Gly Lys Pro Glu Asn Asn Ser Leu Phe Leu Gln Gly Glu

385 390 395 400

Arg Thr Ala Thr Asp Lys Met Pro Lys Gly Gly Asn Tyr Lys Tyr Ile
 405 410 415

Gly Thr Trp Asp Ala Gln Val Ser Lys Glu Asn Asn Trp Val Ala Thr
 420 425 430

Ala Asp Asp Asp Arg Lys Ala Gly Tyr Arg Thr Glu Phe Asp Val Asp
 435 440 445

Phe Gly Asn Lys Asn Leu Ser Gly Lys Leu Phe Asp Lys Asn Gly Val
 450 455 460

Asn Pro Val Phe Thr Val Asp Ala Lys Ile Asp Gly Asn Gly Phe Thr
465 470 475 480

Gly Lys Ala Lys Thr Ser Asp Glu Gly Phe Ala Leu Asp Ser Gly Ser
 485 490 495

Ser Arg Tyr Glu Asn Val Lys Phe Asn Asp Val Ala Val Ser Gly Gly
 500 505 510

Phe Tyr Gly Pro Thr Ala Ala Glu Leu Gly Gly Gln Phe His His Lys
515 520 525

Ser Glu Asn Gly Ser Val Gly Ala Val Phe Gly Ala Lys Gln Gln Val
530 535 540

Lys Lys
545

<210> 100
<211> 593
<212> PRT
<213> Haemophilus influenzae

<400> 100

Met His Phe Lys Leu Asn Pro Tyr Ala Leu Ala Phe Thr Ser Leu Phe
1 5 10 15

Leu Val Ala Cys Ser Gly Gly Lys Gly Ser Phe Asp Leu Glu Asp Val
20 25 30

Arg Pro Asn Gln Thr Ala Lys Ala Glu Lys Ala Thr Thr Ser Tyr Gln
35 40 45

Asp Glu Glu Thr Lys Lys Lys Thr Lys Glu Glu Leu Asp Lys Leu Met
50 55 60

Glu Pro Ala Leu Gly Tyr Glu Thr Gln Ile Leu Arg Arg Asn Lys Ala
65 70 75 80

Pro Lys Thr Glu Thr Gly Glu Lys Arg Asn Glu Arg Val Val Glu Leu
85 90 95

Ser Glu Asp Lys Ile Thr Lys Leu Tyr Gln Glu Ser Val Glu Ile Ile
100 105 110

Pro His Leu Asp Glu Leu Asn Gly Lys Thr Thr Ser Asn Asp Val Tyr
 115 120 125
 His Ser His Asp Ser Lys Arg Leu Asp Lys Asn Arg Asp Leu Lys Tyr
 130 135 140
 Val Arg Ser Gly Tyr Val Tyr Asp Gly Ser Phe Asn Glu Ile Arg Arg
 145 150 155 160
 Asn Asp Ser Gly Phe His Val Phe Lys Gln Gly Ile Asp Gly Tyr Val
 165 170 175
 Tyr Tyr Leu Gly Val Thr Pro Ser Lys Glu Leu Pro Lys Gly Lys Val
 180 185 190
 Ile Ser Tyr Lys Gly Thr Trp Asp Phe Val Ser Asn Ile Asn Leu Glu
 195 200 205
 Arg Glu Ile Asp Gly Phe Asp Thr Ser Gly Asp Gly Lys Asn Val Ser
 210 215 220
 Ala Thr Ser Ile Thr Glu Thr Val Asn Arg Asp His Lys Val Gly Glu
 225 230 235 240
 Lys Leu Gly Asp Asn Glu Val Lys Gly Val Ala His Ser Ser Glu Phe
 245 250 255
 Ala Val Asp Phe Asp Asn Lys Lys Leu Thr Gly Ser Leu Tyr Arg Asn
 260 265 270
 Gly Tyr Ile Asn Arg Asn Lys Ala Gln Glu Val Thr Lys Arg Tyr Ser
 275 280 285
 Ile Glu Ala Asp Ile Ala Gly Asn Arg Phe Arg Gly Lys Ala Lys Ala
 290 295 300
 Glu Lys Ala Gly Asp Pro Ile Phe Thr Asp Ser Asn Tyr Leu Glu Gly
 305 310 315 320
 Gly Phe Tyr Gly Pro Lys Ala Glu Glu Met Ala Gly Lys Phe Phe Thr
 325 330 335
 Asn Asn Lys Ser Leu Phe Ala Val Phe Ala Ala Lys Ser Glu Asn Gly
 340 345 350
 Glu Thr Thr Thr Glu Arg Ile Ile Asp Ala Thr Lys Ile Asp Leu Thr
 355 360 365
 Gln Phe Asn Ala Lys Glu Leu Asn Asn Phe Gly Asp Ala Ser Val Leu
 370 375 380
 Ile Ile Asp Gly Gln Lys Ile Asp Leu Ala Gly Val Asn Phe Lys Asn
 385 390 395 400
 Ser Lys Thr Val Glu Ile Asn Gly Lys Thr Met Val Ala Val Ala Cys
 405 410 415
 Cys Ser Asn Leu Glu Tyr Met Lys Phe Gly Gln Leu Trp Gln Lys Glu

420 425 430
 Gly Lys Gln Gln Val Lys Asp Asn Ser Leu Phe Leu Gln Gly Glu Arg
 435 440 445
 Thr Ala Thr Asp Lys Met Pro Ala Gly Gly Asn Tyr Lys Tyr Val Gly
 450 455 460
 Thr Trp Asp Ala Leu Val Ser Lys Gly Thr Asn Trp Ile Ala Glu Ala
 465 470 475 480
 Asp Asn Asn Arg Glu Ser Gly Tyr Arg Thr Glu Phe Asp Val Asn Phe
 485 490 495
 Ser Asp Lys Lys Val Asn Gly Lys Leu Phe Asp Lys Gly Gly Val Asn
 500 505 510
 Pro Val Phe Thr Val Asp Ala Thr Ile Asn Gly Asn Gly Phe Ile Gly
 515 520 525
 Ser Ala Lys Thr Ser Asp Ser Gly Phe Ala Leu Asp Ala Gly Ser Ser
 530 535 540
 Gln His Gly Asn Ala Val Phe Ser Asp Ile Lys Val Asn Gly Gly Phe
 545 550 555 560
 Tyr Gly Pro Thr Ala Gly Glu Leu Gly Gly Gln Phe His His Lys Ser
 565 570 575
 Asp Asn Gly Ser Val Gly Ala Val Phe Gly Ala Lys Arg Gln Ile Glu
 580 585 590

Lys

<210> 101
 <211> 18
 <212> PRT
 <213> Haemophilus influenzae

<400> 101
 Glu Thr Gln Ser Ile Lys Asp Thr Lys Glu Ala Ile Ser Ser Glu Val
 1 5 10 15

Asp Thr

<210> 102
 <211> 20
 <212> PRT
 <213> Haemophilus influenzae

<400> 102
 Leu Gln Leu Asn Leu Glu Lys Lys Ile Gln Gln Asn Trp Leu Thr His
 1 5 10 15

Gln Ile Ala Phe

20

<210> 103
 <211> 23
 <212> PRT
 <213> Haemophilus influenzae

<400> 103
 Met Thr Lys Lys Pro Tyr Phe Arg Leu Ser Ile Ile Ser Cys Leu Leu
 1 5 10 15
 Ile Ser Cys Tyr Val Lys Ala
 20

<210> 104
 <211> 17
 <212> PRT
 <213> Haemophilus influenzae

<400> 104
 Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
 1 5 10 15
 Ala

<210> 105
 <211> 5144
 <212> DNA
 <213> Haemophilus influenzae

<400> 105
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 ataagaaaga aatttgtttt acgccatttt tcatatttta tccatgaact taaaaaattc 120
 taagttgaca ttattacaaa aaaagaacaa taatgcgaat tattatcaat tttgtataag 180
 aatataattc tatgaaatct gtacctctta tctctgggtg actttccttt ttattaagtg 240
 cttgtagcgg aggagggtct tttgatgtag ataacgtctc taatccctcc tcttctaaac 300
 cacgttatca agacgatacc tcgaatcaaa gaacaaaatc tgatttgcaa aagttgtcca 360
 ttccttcttt aggggggagg atgaagttag tggctcagaa tcttcttggt aagaaagaac 420
 ctagtctctt aaataatgaa gatggctata tgatattttc ctcactttct acgattgaag 480
 aggatgttac aaaagaaaaat aaatctcagg aaccactat tggctcaata gacgagccta 540
 gcaaaacaaa ttcaccccaa aatcatcatg gcaatatgta tattcgggtc tttattatat 600
 tcaatcgtgg cgtaattcct caaatggcaa gttttattca gggtactatg gatatgcgta 660
 ttactttggc aagcaaacag ccactacatt acctgtagat ggcgaagcaa cgtataaagg 720
 aacttggcac ttcatcaccc caactgaaaa tggcaaaaag tattctttgt tcagtaatga 780
 tagcgggtcaa gcttatcgca gacgtagtgc aattccagaa gatattgatt tagaaaaaaa 840
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 aaagctcact ggaaaacttt attataatga aagagaaaca gaacttaata aatcaaaaaga 960
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 aggtggtttt tatgggccta aaggtgaaga actaggagga aagtttttag ctggcgataa 1140
 aaaagttttt ggggtattta gtgcaaaga aacggaagaa acaaaaaaga aagcgttatt 1200
 caaggaaacc ttaattgatg gcaagctaac tacttttaaa acaaccaatg caacaaccaa 1260
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 gtgtcctctt ttacctgaga gtggtgattt cataagtagt aagcaccata ctgtaggaaa 1440

gaaaacctat caagtagaag catgttgcag taatctaagc tatgtgaaat ttgggtatggt 1500
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 gcatcttttt ctgttctata atctgcttaa gtgaaaaacc aaacttggtt tttttacaag 4980

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 aaaaacaata aggatccttt tgtgactctc tcaatctttg gcaagttgct gttacaactt 5100
 cagatcaagt ttcagccagc gatcttaggc acttggggttc ggcc 5144

<210> 106
 <211> 168
 <212> PRT
 <213> Haemophilus influenzae

<400> 106

Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
 1 5 10 15
 Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Pro
 20 25 30
 Ser Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Thr
 35 40 45
 Lys Ser Asp Leu Gln Lys Leu Ser Ile Pro Ser Leu Gly Gly Gly Met
 50 55 60
 Lys Leu Val Ala Gln Asn Leu Leu Gly Lys Lys Glu Pro Ser Leu Leu
 65 70 75 80
 Asn Asn Glu Asp Gly Tyr Met Ile Phe Ser Ser Leu Ser Thr Ile Glu
 85 90 95
 Glu Asp Val Thr Lys Glu Asn Lys Ser Gln Glu Pro Thr Ile Gly Ser
 100 105 110
 Ile Asp Glu Pro Ser Lys Thr Asn Ser Pro Gln Asn His His Gly Asn
 115 120 125
 Met Tyr Ile Arg Val Phe Ile Ile Phe Asn Arg Gly Val Ile Pro Gln
 130 135 140
 Met Ala Ser Phe Ile Gln Val Thr Met Asp Met Arg Ile Thr Leu Ala
 145 150 155 160
 Ser Lys Gln Pro Leu His Tyr Leu
 165

<210> 107
 <211> 911
 <212> PRT
 <213> Haemophilus influenzae

<400> 107

Met Thr Lys Lys Pro Tyr Phe Arg Leu Ser Ile Ile Ser Cys Leu Leu
 1 5 10 15
 Ile Ser Cys Tyr Val Lys Ala Glu Thr Gln Ser Ile Lys Asp Thr Lys
 20 25 30
 Glu Ala Ile Ser Ser Glu Val Asp Thr Gln Ser Thr Glu Asp Ser Glu
 35 40 45

Leu Glu Thr Ile Ser Val Thr Ala Glu Lys Ile Arg Asp Arg Lys Asp
 50 55 60
 Asn Glu Val Thr Gly Leu Gly Lys Ile Ile Lys Thr Ser Glu Ser Ile
 65 70 75 80
 Ser Arg Glu Gln Val Leu Asn Ile Arg Asp Leu Thr Arg Tyr Asp Pro
 85 90 95
 Gly Ile Ser Val Val Glu Gln Gly Arg Gly Ala Ser Ser Gly Tyr Ser
 100 105 110
 Ile Arg Gly Met Asp Arg Asn Arg Val Ala Leu Leu Val Asp Gly Leu
 115 120 125
 Pro Gln Thr Gln Ser Tyr Val Val Gln Ser Pro Leu Val Ala Arg Ser
 130 135 140
 Gly Tyr Ser Gly Thr Gly Ala Ile Asn Glu Ile Glu Tyr Glu Asn Val
 145 150 155 160
 Lys Ala Val Glu Ile Ser Lys Gly Gly Ser Ser Ser Glu Tyr Gly Asn
 165 170 175
 Gly Ala Leu Ala Gly Ser Val Thr Phe Gln Ser Lys Ser Ala Ala Asp
 180 185 190
 Ile Leu Glu Gly Asp Lys Ser Trp Gly Ile Gln Thr Lys Asn Ala Tyr
 195 200 205
 Ser Ser Lys Asn Lys Gly Phe Thr His Ser Leu Ala Val Ala Gly Lys
 210 215 220
 Gln Gly Gly Phe Glu Gly Val Ala Ile Tyr Thr Gln Arg Asn Ser Glu
 225 230 235 240
 Glu Thr Gln Val His Lys Asp Ala Leu Lys Gly Val Gln Ser Tyr Glu
 245 250 255
 Arg Phe Ile Ala Thr Thr Asp Lys Ser Ser Gly Tyr Phe Val Ile Gln
 260 265 270
 Gly Glu Cys Pro Asn Gly Asp Asp Lys Cys Ala Ala Lys Pro Pro Ala
 275 280 285
 Lys Leu Ser Pro Gln Ser Glu Thr Val Ser Val Ser Asp Tyr Thr Gly
 290 295 300
 Ala Asn Arg Ile Lys Pro Asn Pro Met Lys Tyr Glu Ser Gln Ser Trp
 305 310 315 320
 Phe Leu Arg Gly Gly Tyr His Phe Ser Glu Gln His Tyr Ile Gly Gly
 325 330 335
 Ile Phe Glu Phe Thr Gln Gln Lys Phe Asp Ile Arg Asp Met Thr Phe
 340 345 350
 Pro Ala Tyr Leu Arg Ser Thr Glu Lys Arg Asp Asp Arg Thr Gly Pro

355 360 365
 Phe Tyr Pro Lys Gln Asp Tyr Gly Ala Tyr Gln Arg Ile Glu Asp Gly
 370 375 380
 Arg Gly Val Asn Tyr Ala Ser Gly Leu Tyr Phe Asp Glu His His Arg
 385 390 395 400
 Lys Gln Arg Val Gly Ile Glu Tyr Ile Tyr Glu Asn Lys Asn Lys Ala
 405 410 415
 Gly Ile Ile Asp Lys Ala Val Leu Ser Ala Asn Gln Gln Asn Ile Ile
 420 425 430
 Leu Asp Ser Tyr Met Arg His Thr His Cys Ser Leu Tyr Pro Asn Pro
 435 440 445
 Ser Lys Asn Cys Arg Pro Thr Leu Asp Lys Pro Tyr Ser Tyr Tyr Arg
 450 455 460
 Ser Asp Arg Asn Val Tyr Lys Glu Lys His Asn Met Leu Gln Leu Asn
 465 470 475 480
 Leu Glu Lys Lys Ile Gln Gln Asn Trp Leu Thr His Gln Ile Val Phe
 485 490 495
 Asn Leu Gly Phe Asp Asp Phe Thr Ser Ala Leu Gln His Lys Asp Tyr
 500 505 510
 Leu Thr Arg Arg Val Thr Ala Thr Ala Asn Ile Ile Ser Gly Thr Val
 515 520 525
 Ala Gly Lys Arg Arg Asn Gly Tyr Glu Lys Gln Pro Tyr Leu Tyr Ser
 530 535 540
 Lys Pro Lys Val Asp Phe Val Gly Gln Asp His Cys Asn Tyr Lys Gly
 545 550 555 560
 Ser Ser Ser Asn Tyr Ser Asp Cys Lys Val Arg Leu Ile Lys Gly Lys
 565 570 575
 Asn Tyr Tyr Phe Ala Ala Arg Asn Asn Met Ala Leu Gly Lys Tyr Ile
 580 585 590
 Asp Leu Gly Leu Gly Ile Arg Tyr Asp Val Ser Arg Thr Lys Ala Asn
 595 600 605
 Glu Ser Thr Ile Ser Val Gly Lys Phe Lys Asn Phe Ser Trp Asn Thr
 610 615 620
 Gly Ile Val Ile Lys Pro Thr Glu Trp Leu Asp Leu Ser Tyr Arg Leu
 625 630 635 640
 Ser Thr Gly Phe Arg Asn Pro Ser Phe Ala Glu Met Tyr Gly Trp Arg
 645 650 655
 Tyr Gly Gly Asn Asn Ser Asp Val Tyr Val Gly Lys Phe Lys Pro Glu
 660 665 670

Thr Ser Arg Asn Gln Glu Phe Gly Leu Ala Leu Lys Gly Asp Phe Gly
 675 680 685
 Asn Ile Glu Ile Ser His Phe Ser Asn Ala Tyr Arg Asn Leu Ile Ala
 690 695 700
 Phe Ala Glu Glu Leu Ser Lys Asn Gly Thr Thr Gly Lys Gly Asn Tyr
 705 710 715 720
 Gly Tyr His Asn Ala Gln Asn Ala Lys Leu Val Gly Val Asn Ile Thr
 725 730 735
 Ala Gln Leu Asp Phe Asn Gly Leu Trp Lys Arg Ile Pro Tyr Gly Trp
 740 745 750
 Tyr Ala Thr Phe Ala Tyr Asn Arg Val Lys Val Lys Asp Gln Lys Ile
 755 760 765
 Asn Ala Gly Leu Ala Ser Val Ser Ser Tyr Leu Phe Asp Ala Ile Gln
 770 775 780
 Pro Ser Arg Tyr Ile Ile Gly Leu Gly Tyr Asp His Pro Ser Asn Thr
 785 790 795 800
 Trp Gly Ile Asn Thr Met Phe Thr Gln Ser Lys Ala Lys Ser Gln Asn
 805 810 815
 Glu Leu Leu Gly Gln Arg Ala Leu Gly Asn Asn Ser Arg Asn Val Lys
 820 825 830
 Ser Thr Arg Lys Leu Thr Arg Ala Trp His Ile Leu Asp Val Ser Gly
 835 840 845
 Tyr Tyr Met Ala Asn Lys Asn Ile Met Leu Arg Leu Gly Ile Tyr Asn
 850 855 860
 Leu Phe Asn Tyr Arg Tyr Val Thr Trp Glu Ala Val Arg Gln Thr Ala
 865 870 875 880
 Gln Gly Ala Val Asn Gln His Gln Asn Val Gly Ser Tyr Thr Arg Tyr
 885 890 895
 Ala Ala Ser Gly Arg Asn Tyr Thr Leu Thr Leu Glu Met Lys Phe
 900 905 910

<210> 108
 <211> 1993
 <212> DNA
 <213> Haemophilus influenzae

<400> 108
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 ggggaggtgg ttcttttggat gtagatgacg tctctaattc ctcctcttct aaaccacgtt 120
 atcaagacga tacttcaagt tcaagaacaa aatctaaatt ggaaaatttg tccattcctt 180
 ctttaggggg agggatgaag ttagtggtc agaatcttcg tgataggaca aaacctagtc 240
 tcttaaataga agatgactat atgatatttt cctcactttc aacgattaaa gctgatgttg 300
 aaaaagaaaa taaacactat acaagtccag ttggtcatt agacgagcct agtacaacaa 360
 atccaaaaga aaatgatcat ggacaaagat atgtatatcc aggactttat tatattccat 420

```

cgtggaat t aaacgatctt aaaaataaca agtattatta ttctgggttac tatggatatg 480
cgtattactt tggcaagcaa acagccacta cattacctgt aaatggcaaa gtaacgtata 540
aaggaacttg gagcttcac accgcagctg aaaatggcaa aaggtatcct ttgttaagta 600
atggcagtc agcttatttt cgacgtagtg caattccaga agatattgat ttagaagtta 660
aaaatgatga gaatagagaa aaagggctag tgagtgaatt tagtgcagat tttgggacta 720
aaaaactgac aggaggactg ttttacacca aaagacaaac tcatattcaa aaccatgaaa 780
agaaaaaact ctatgatata gatgcccata tttatagtaa tagattcaga ggtaaagtaa 840
atcctaccca aaaagattct aaagaacatc cttttaccag cgaggggaaca ttagaagggtg 900
gtttttacgg gcctgaaggt caagaattag gaggaaggtt tttagctggc gacaaaaaag 960
tttttggggt atttagtgcc aaaggaacgg aagaaaacaa aaaattacc aaagaaacct 1020
taattgatgg caagctaact actttctcta ctaaaacaac cgatgcaaaa accaatgcaa 1080
cagccaatgc aacaaccagt accgcagcca atacaacaac cgatacaaca gccaatacaa 1140
taaccgatgc agaaaacttt aagacgaaag atatatcaag ttttggtgaa gctgattacc 1200
ttttaattga taattaccct gttcctcttt tacctgagag tgggtgatttc ataagtagta 1260
agcaccatac tgtaggaaag aaaacctatc aagtaaaagc atgttgagc aatctaagct 1320
atgtgaaatt tggatatgat tatgaagtcc cacctaaaga agaagaaaaa gacaaagaaa 1380
aaaaagaaaa agaaaaagaa aaacaagcga caaatctatc gaacacttat tatcaattct 1440
tattaggtct cgtactccc agttctgaaa ttcctaaagg aggaagtgc aaatatctcg 1500
gtagttgggt tggttatctg agcgatgggt caacatctta cccccagc ggtgataaga 1560
aacgcgagaa caatgctctc gccgagttta atgtaaat tgtcgataaa acattaaaag 1620
gccaattaat acgacacgat aatcaaaata ccgtttttac aattgatgca acctttaaag 1680
gtggtagaa taacttcact ggtacagcaa ccgcaacaa tgtagcgatt gatcccaaaa 1740
gtacacaagg cacatctaac gtcaatttca cggcaacagt aaatggggca ttttatgggc 1800
cgaacgctac agaattaggc ggttatttca cctataacgg aaatcctaca gataaaagtt 1860
cctcaaccgt accttcac tccaattcaa aaaatgcaag agctgcagtt gtctttgggtg 1920
cgagacaaca agtagaaaca accaaataat ggaatactaa aaatgactaa aaaagcttct 1980
agaagccgaa ttc 1993

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<210> 109
 <211> 648
 <212> PRT
 <213> Haemophilus influenzae

<400> 109
 Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
 1 5 10 15
 Ala Cys Ser Gly Gly Gly Gly Ser Phe Asp Val Asp Asp Val Ser Asn
 20 25 30
 Pro Ser Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Ser Ser Arg
 35 40 45
 Thr Lys Ser Lys Leu Glu Asn Leu Ser Ile Pro Ser Leu Gly Gly Gly
 50 55 60
 Met Lys Leu Val Ala Gln Asn Leu Arg Asp Arg Thr Lys Pro Ser Leu
 65 70 75 80
 Leu Asn Glu Asp Asp Tyr Met Ile Phe Ser Ser Leu Ser Thr Ile Lys
 85 90 95
 Ala Asp Val Glu Lys Glu Asn Lys His Tyr Thr Ser Pro Val Gly Ser
 100 105 110
 Ile Asp Glu Pro Ser Thr Thr Asn Pro Lys Glu Asn Asp His Gly Gln
 115 120 125

Arg Tyr Val Tyr Ser Gly Leu Tyr Tyr Ile Pro Ser Trp Asn Leu Asn
 130 135 140
 Asp Leu Lys Asn Asn Lys Tyr Tyr Tyr Ser Gly Tyr Tyr Gly Tyr Ala
 145 150 155 160
 Tyr Tyr Phe Gly Lys Gln Thr Ala Thr Thr Leu Pro Val Asn Gly Lys
 165 170 175
 Val Thr Tyr Lys Gly Thr Trp Ser Phe Ile Thr Ala Ala Glu Asn Gly
 180 185 190
 Lys Arg Tyr Pro Leu Leu Ser Asn Gly Ser Gln Ala Tyr Phe Arg Arg
 195 200 205
 Ser Ala Ile Pro Glu Asp Ile Asp Leu Glu Val Lys Asn Asp Glu Asn
 210 215 220
 Arg Glu Lys Gly Leu Val Ser Glu Phe Ser Ala Asp Phe Gly Thr Lys
 225 230 235 240
 Lys Leu Thr Gly Gly Leu Phe Tyr Thr Lys Arg Gln Thr His Ile Gln
 245 250 255
 Asn His Glu Lys Lys Lys Leu Tyr Asp Ile Asp Ala His Ile Tyr Ser
 260 265 270
 Asn Arg Phe Arg Gly Lys Val Asn Pro Thr Gln Lys Asp Ser Lys Glu
 275 280 285
 His Pro Phe Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro
 290 295 300
 Glu Gly Gln Glu Leu Gly Gly Lys Phe Leu Ala Gly Asp Lys Lys Val
 305 310 315 320
 Phe Gly Val Phe Ser Ala Lys Gly Thr Glu Glu Asn Lys Lys Leu Pro
 325 330 335
 Lys Glu Thr Leu Ile Asp Gly Lys Leu Thr Thr Phe Ser Thr Lys Thr
 340 345 350
 Thr Asp Ala Lys Thr Asn Ala Thr Ala Asn Ala Thr Thr Ser Thr Ala
 355 360 365
 Ala Asn Thr Thr Thr Asp Thr Thr Ala Asn Thr Ile Thr Asp Ala Glu
 370 375 380
 Asn Phe Lys Thr Lys Asp Ile Ser Ser Phe Gly Glu Ala Asp Tyr Leu
 385 390 395 400
 Leu Ile Asp Asn Tyr Pro Val Pro Leu Leu Pro Glu Ser Gly Asp Phe
 405 410 415
 Ile Ser Ser Lys His His Thr Val Gly Lys Lys Thr Tyr Gln Val Lys
 420 425 430
 Ala Cys Cys Ser Asn Leu Ser Tyr Val Lys Phe Gly Met Tyr Tyr Glu
 435 440 445

Val Pro Pro Lys Glu Glu Glu Lys Asp Lys Glu Lys Lys Glu Lys Glu
450 455 460

Lys Glu Lys Gln Ala Thr Asn Leu Ser Asn Thr Tyr Tyr Gln Phe Leu
465 470 475 480

Leu Gly Leu Arg Thr Pro Ser Ser Glu Ile Pro Lys Gly Gly Ser Ala
485 490 495

Lys Tyr Leu Gly Ser Trp Phe Gly Tyr Leu Ser Asp Gly Ser Thr Ser
500 505 510

Tyr Ser Pro Ser Gly Asp Lys Lys Arg Glu Asn Asn Ala Leu Ala Glu
515 520 525

Phe Asn Val Asn Phe Val Asp Lys Thr Leu Lys Gly Gln Leu Ile Arg
530 535 540

His Asp Asn Gln Asn Thr Val Phe Thr Ile Asp Ala Thr Phe Lys Gly
545 550 555 560

Gly Lys Asn Asn Phe Thr Gly Thr Ala Thr Ala Asn Asn Val Ala Ile
565 570 575

Asp Pro Gln Ser Thr Gln Gly Thr Ser Asn Val Asn Phe Thr Ala Thr
580 585 590

Val Asn Gly Ala Phe Tyr Gly Pro Asn Ala Thr Glu Leu Gly Gly Tyr
595 600 605

Phe Thr Tyr Asn Gly Asn Pro Thr Asp Lys Ser Ser Ser Thr Val Pro
610 615 620

Ser Ser Ser Asn Ser Lys Asn Ala Arg Ala Ala Val Val Phe Gly Ala
625 630 635 640

Arg Gln Gln Val Glu Thr Thr Lys
645

<210> 110

<211> 1974

<212> DNA

<213> Haemophilus influenzae

<400> 110

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actaagtgt tgtagcggag gggggtcttt tgatgtagat aacgtctcta atccatcctc 120
ttctaaacca cggtatcaag acgatacttc aagttcaaga acaaaatcta atttgaaaaa 180
gttggtccatt ccttcttttag ggggagggat gaagtttagtg gctcagaatc ttagtgataa 240
gaacaaacct agtctcttaa atgaagatga ctatatatca tatttttcct cactttctac 300
aattcaagat gatgttaaaa aagaaaataa acgccataca aatccagttg gctcaataga 360
cgagcctaac gcaacaaatc caccgaaaa gcatacatgga caaagatatg tatattcagg 420
gctttattat attccatcgt ggagtcattc ctcaaattggc aagctttatt taggttacta 480
tggatatgog ttttattatg gtaataaaaac tgcaacaaac ttgccagtaa gcggcatagc 540
taaatacaaaa ggaacttggg attttattac tgcaactaaa aatggccaac gttattcttt 600
atttggtagc gcttttggag cttataatag acgcagtgtc atttcagaag atatagataa 660
tttagaaaat aatctaaaga atggtgcggg attaactagt gaattttactg tcaatttttg 720


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tacgaaaaag ctactggaa aactttatta taatgaaagg gaaacaaatc ttaataaatt 780
acaaaagaga aaacatgaac tctatgatat agatgccgat atttatagta atagattcag 840
aggtaaagta aagccaacaa cccaaaaaga ttctcaagaa catcccttta ccagcgaggg 900
aacattagaa ggtggttttt atgggcctaa cgggtgaagaa ttaggaggaa agtttttagc 960
tggcgataac cgagtttttg gggatatttag tgccaaagaa gaagaaacaa aagacaaaaa 1020
attatccaga gaaaccttaa ttgatggcaa gctaattact tttaaaagaa ctgatgcaac 1080
aaccaataca gcagccaatg caaaaaccga tgaaaaaac tttacgacga aagatatacc 1140
aagttttggt gaagctgatt accttttaat tgataattac cctgttcctc ttttcctga 1200
agaaaatact aatgatttca taactagtag gcaccataag gtaggagata aaacctataa 1260
agtagaagca tgttgcaaga atctaagcta tgtgaaattt ggtatgtatt atgaagaccc 1320
attaaatgga gaaaatggca aagaaaaaga aaaagaaaaa gaaaaagaca aagaaaaaca 1380
agcgacaaca tctatcaaga cttattatca attcttatta ggtcaccgta ctgccaaggc 1440
cgacatacct gcaacgggaa acgtgaaata tcgcggtaat tggtttggtt atattggtga 1500
tgacaagaca tcttactcca ctactggaga taaaaatgct gtcgccgagt ttgatgtaaa 1560
ttttgccgat aaaacattaa caggcacatt aaaacgacac gataatggaa atcccgtatt 1620
tacaattaat gcaagctttc aaagtggtaa gaatgacttc actggtacag caaccgcaaa 1680
caatgtagcg attgatcccc aaaatacaca aaccacatct agagtcaatt tcacggcaac 1740
agtaaacggg gcattttatg gacctaaggc tacagaatta ggcggttatt tcacttataa 1800
cggaacaat cctacagata aaaattcctc aaccgtttca ccatccaatt cagcaaatgc 1860
tcgtgctgcc gttgtgtttg gcgctaaaaa acaagtagaa acaaccaaca agtaaaaaa 1920
accaagtaat ggaatactaa aaatgactaa aaaagcttct agaaagccga attc 1974

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<210> 111

<211> 631

<212> PRT

<213> Haemophilus influenzae

<400> 111

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Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
  1              5              10              15

```

```

Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Pro
      20              25              30

```

```

Ser Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Ser Ser Arg Thr
      35              40              45

```

```

Lys Ser Asn Leu Lys Lys Leu Ser Ile Pro Ser Leu Gly Gly Gly Met
      50              55              60

```

```

Lys Leu Val Ala Gln Asn Leu Ser Asp Lys Asn Lys Pro Ser Leu Leu
      65              70              75              80

```

```

Asn Glu Asp Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Thr Ile Gln
      85              90              95

```

```

Asp Asp Val Lys Lys Glu Asn Lys Arg His Thr Asn Pro Val Gly Ser
      100              105              110

```

```

Ile Asp Glu Pro Asn Ala Thr Asn Pro Pro Glu Lys His His Gly Gln
      115              120              125

```

```

Arg Tyr Val Tyr Ser Gly Leu Tyr Tyr Ile Pro Ser Trp Ser His Ser
      130              135              140

```

```

Ser Asn Gly Lys Leu Tyr Leu Gly Tyr Tyr Gly Tyr Ala Phe Tyr Tyr
      145              150              155              160

```

Gly Asn Lys Thr Ala Thr Asn Leu Pro Val Ser Gly Ile Ala Lys Tyr
 165 170 175
 Lys Gly Thr Trp Asp Phe Ile Thr Ala Thr Lys Asn Gly Gln Arg Tyr
 180 185 190
 Ser Leu Phe Gly Ser Ala Phe Gly Ala Tyr Asn Arg Arg Ser Ala Ile
 195 200 205
 Ser Glu Asp Ile Asp Asn Leu Glu Asn Asn Leu Lys Asn Gly Ala Gly
 210 215 220
 Leu Thr Ser Glu Phe Thr Val Asn Phe Gly Thr Lys Lys Leu Thr Gly
 225 230 235 240
 Lys Leu Tyr Tyr Asn Glu Arg Glu Thr Asn Leu Asn Lys Leu Gln Lys
 245 250 255
 Arg Lys His Glu Leu Tyr Asp Ile Asp Ala Asp Ile Tyr Ser Asn Arg
 260 265 270
 Phe Arg Gly Lys Val Lys Pro Thr Thr Gln Lys Asp Ser Gln Glu His
 275 280 285
 Pro Phe Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn
 290 295 300
 Gly Glu Glu Leu Gly Gly Lys Phe Leu Ala Gly Asp Asn Arg Val Phe
 305 310 315 320
 Gly Val Phe Ser Ala Lys Glu Glu Glu Thr Lys Asp Lys Lys Leu Ser
 325 330 335
 Arg Glu Thr Leu Ile Asp Gly Lys Leu Ile Thr Phe Lys Arg Thr Asp
 340 345 350
 Ala Thr Thr Asn Thr Ala Ala Asn Ala Lys Thr Asp Glu Lys Asn Phe
 355 360 365
 Thr Thr Lys Asp Ile Pro Ser Phe Gly Glu Ala Asp Tyr Leu Leu Ile
 370 375 380
 Asp Asn Tyr Pro Val Pro Leu Phe Pro Glu Glu Asn Thr Asn Asp Phe
 385 390 395 400
 Ile Thr Ser Arg His His Lys Val Gly Asp Lys Thr Tyr Lys Val Glu
 405 410 415
 Ala Cys Cys Lys Asn Leu Ser Tyr Val Lys Phe Gly Met Tyr Tyr Glu
 420 425 430
 Asp Pro Leu Asn Gly Glu Asn Gly Lys Glu Lys Glu Lys Glu Lys Glu
 435 440 445
 Lys Asp Lys Glu Lys Gln Ala Thr Thr Ser Ile Lys Thr Tyr Tyr Gln
 450 455 460
 Phe Leu Leu Gly His Arg Thr Ala Lys Ala Asp Ile Pro Ala Thr Gly
 465 470 475 480

Asn Val Lys Tyr Arg Gly Asn Trp Phe Gly Tyr Ile Gly Asp Asp Lys
 485 490 495
 Thr Ser Tyr Ser Thr Thr Gly Asp Lys Asn Ala Val Ala Glu Phe Asp
 500 505 510
 Val Asn Phe Ala Asp Lys Thr Leu Thr Gly Thr Leu Lys Arg His Asp
 515 520 525
 Asn Gly Asn Pro Val Phe Thr Ile Asn Ala Ser Phe Gln Ser Gly Lys
 530 535 540
 Asn Asp Phe Thr Gly Thr Ala Thr Ala Asn Asn Val Ala Ile Asp Pro
 545 550 555 560
 Gln Asn Thr Gln Thr Thr Ser Arg Val Asn Phe Thr Ala Thr Val Asn
 565 570 575
 Gly Ala Phe Tyr Gly Pro Lys Ala Thr Glu Leu Gly Gly Tyr Phe Thr
 580 585 590
 Tyr Asn Gly Asn Asn Pro Thr Asp Lys Asn Ser Ser Thr Val Ser Pro
 595 600 605
 Ser Asn Ser Ala Asn Ala Arg Ala Ala Val Val Phe Gly Ala Lys Lys
 610 615 620
 Gln Val Glu Thr Thr Asn Lys
 625 630

<210> 112
 <211> 1951
 <212> DNA
 <213> Haemophilus influenzae

<400> 112
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 caagacgata cctcgagtca aagaacaaaa tctaatttgg aaaagtgtgc cattccttct 180
 ttaggaggag ggatgaaatt ggtggctcag aatctgagtg gtaataaaga acctagtctt 240
 ttaaatggaa atgactatat gatattttcc tcacgttcta cgattaaaga tgatgttgaa 300
 aataacaata caaacggggg ggactatat ggctcaatag acgagcctag tacaacaaat 360
 ccactcgaaa agcatcatgg acaaagggtat gtatatctag ggctttatta tattcaatcg 420
 tggagtctaa gagatttacc aaagaagttt tattcaggtt actatggata tgcgtattac 480
 tttggcaagg aaacagccac tacattacct gtaaatggcg aagcaacgta taaaggaact 540
 tgggatttca tcaactgcaac tagaaatggc aaaagttatt ctttggttaag taataaccga 600
 caagcttatt ccaaacgtag tgcaattcca gaagacattg atttagaaaa tgatccaaag 660
 aatgggtgaga cgagattaac tagtgaattt actgtgaatt ttggtacgaa aaagctcaca 720
 ggtggacttt attaccattt acgtaaaaca aatgctaattg aaaacaaaa tagaaaacat 780
 aaactctaca atctagaagc tgatgtgtat agcaaccgat tcagaggtaa agtaaagcca 840
 accaaagagt cttctgaaga acatcccttt accagcgagg gaacattaga aggtggtttt 900
 tatgggccta atgctgaaga actaggggga aaatttttag ctagcgataa aaaagttttt 960
 ggggtattta gtgccaaaga acagcaagaa acggaagaaa acaaaaaatt actcaaagaa 1020
 accttaattg atggcaagct aactactttc tctactaaaa aaaccaatgc aacaaccgat 1080
 gcaacaacca gtacaacaac cagtacagca accaatgcaa cagccgatgc agaaaacttt 1140
 acgacaaaag atatatcaag ttttgggtgaa gctgattatc ttttaattga taattacct 1200
 gttcctcttt tacctgaaaa tactaatgat ttcataagca gtaagcacca tgaggttaga 1260

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ggtaaact ataaagtga agcatgttgc aagaatctaa gctatgtgaa atttgggtata 1320
tattatgagg ataatgagaa gaacacccaaa attgaaacag aacaataacca ccaattttttg 1380
ttaggtctcc gtactcccag ttctcaaatt cctgcaacgg gaaacgtgaa atatcgcggt 1440
agttgggttg gttatatttg tgatgacaag acatcttact ccactactgg agataaaaaat 1500
gctctcgccg agtttgatgt aaattttacc gataaaaagc taacaggcga attaaaacga 1560
gccgataatc aaaataccgt atttagaatt aatgcagact ttaaaaataa tgataatgcc 1620
ttcaaaggta cagcaaccgc agaaaatttt gtaatagatg gtaacaatag tcaaactgga 1680
aatacccaaaa ttaatatata aactgaagta aatggggcat tttatgggtcc gaacgctaca 1740
gaattaggcg gttatttcac ttataacgga aaaaatccta cagataaaaaa ttctgaaagt 1800
tcctcaaccg taccttcacc acccaattca ccaaatacaa gagctgcagt tgtctttggt 1860
gctaaaaaac aagtagaaaa aaacaacaag taaaaacaac caagtaatgg aataactaaa 1920
atgactaaaa aagcttctag aagccgaatt c 1951

```

<210> 113

<211> 630

<212> PRT

<213> Haemophilus influenzae

<400> 113

```

Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Leu Leu Leu Ser
  1              5              10              15

```

```

Ala Cys Ser Gly Gly Gly Gly Ser Phe Asp Val Asp Asp Val Ser Asn
      20              25              30

```

```

Pro Ser Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Ser Gln Arg
      35              40              45

```

```

Thr Lys Ser Asn Leu Glu Lys Leu Ser Ile Pro Ser Leu Gly Gly Gly
      50              55              60

```

```

Met Lys Leu Val Ala Gln Asn Leu Ser Gly Asn Lys Glu Pro Ser Phe
      65              70              75              80

```

```

Leu Asn Gly Asn Asp Tyr Met Ile Phe Ser Ser Arg Ser Thr Ile Lys
      85              90              95

```

```

Asp Asp Val Glu Asn Asn Asn Thr Asn Gly Gly Asp Tyr Ile Gly Ser
      100             105             110

```

```

Ile Asp Glu Pro Ser Thr Thr Asn Pro Leu Glu Lys His His Gly Gln
      115             120             125

```

```

Arg Tyr Val Tyr Ser Gly Leu Tyr Tyr Ile Gln Ser Trp Ser Leu Arg
      130             135             140

```

```

Asp Leu Pro Lys Lys Phe Tyr Ser Gly Tyr Tyr Gly Tyr Ala Tyr Tyr
      145             150             155             160

```

```

Phe Gly Lys Glu Thr Ala Thr Thr Leu Pro Val Asn Gly Glu Ala Thr
      165             170             175

```

```

Tyr Lys Gly Thr Trp Asp Phe Ile Thr Ala Thr Arg Asn Gly Lys Ser
      180             185             190

```

```

Tyr Ser Leu Leu Ser Asn Asn Arg Gln Ala Tyr Ser Lys Arg Ser Ala
      195             200             205

```

Ile Pro Glu Asp Ile Asp Leu Glu Asn Asp Pro Lys Asn Gly Glu Thr
 210 215 220
 Arg Leu Thr Ser Glu Phe Thr Val Asn Phe Gly Thr Lys Lys Leu Thr
 225 230 235 240
 Gly Gly Leu Tyr Tyr His Leu Arg Lys Thr Asn Ala Asn Glu Asn Gln
 245 250 255
 Asn Arg Lys His Lys Leu Tyr Asn Leu Glu Ala Asp Val Tyr Ser Asn
 260 265 270
 Arg Phe Arg Gly Lys Val Lys Pro Thr Lys Glu Ser Ser Glu Glu His
 275 280 285
 Pro Phe Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn
 290 295 300
 Ala Glu Glu Leu Gly Gly Lys Phe Leu Ala Ser Asp Lys Lys Val Phe
 305 310 315 320
 Gly Val Phe Ser Ala Lys Glu Gln Gln Glu Thr Glu Glu Asn Lys Lys
 325 330 335
 Leu Leu Lys Glu Thr Leu Ile Asp Gly Lys Leu Thr Thr Phe Ser Thr
 340 345 350
 Lys Lys Thr Asn Ala Thr Thr Asp Ala Thr Thr Ser Thr Thr Thr Ser
 355 360 365
 Thr Ala Thr Asn Ala Thr Ala Asp Ala Glu Asn Phe Thr Thr Lys Asp
 370 375 380
 Ile Ser Ser Phe Gly Glu Ala Asp Tyr Leu Leu Ile Asp Asn Tyr Pro
 385 390 395 400
 Val Pro Leu Leu Pro Glu Asn Thr Asn Asp Phe Ile Ser Ser Lys His
 405 410 415
 His Glu Val Gly Gly Lys His Tyr Lys Val Glu Ala Cys Cys Lys Asn
 420 425 430
 Leu Ser Tyr Val Lys Phe Gly Ile Tyr Tyr Glu Asp Asn Glu Lys Asn
 435 440 445
 Thr Lys Ile Glu Thr Glu Gln Tyr His Gln Phe Leu Leu Gly Leu Arg
 450 455 460
 Thr Pro Ser Ser Gln Ile Pro Ala Thr Gly Asn Val Lys Tyr Arg Gly
 465 470 475 480
 Ser Trp Phe Gly Tyr Ile Gly Asp Asp Lys Thr Ser Tyr Ser Thr Thr
 485 490 495
 Gly Asp Lys Asn Ala Leu Ala Glu Phe Asp Val Asn Phe Thr Asp Lys
 500 505 510
 Lys Leu Thr Gly Glu Leu Lys Arg Ala Asp Asn Gln Asn Thr Val Phe
 515 520 525

Arg Ile Asn Ala Asp Phe Lys Asn Asn Asp Asn Ala Phe Lys Gly Thr
530 535 540

Ala Thr Ala Glu Asn Phe Val Ile Asp Gly Asn Asn Ser Gln Thr Gly
545 550 555 560

Asn Thr Gln Ile Asn Ile Lys Thr Glu Val Asn Gly Ala Phe Tyr Gly
565 570 575

Pro Asn Ala Thr Glu Leu Gly Gly Tyr Phe Thr Tyr Asn Gly Lys Asn
580 585 590

Pro Thr Asp Lys Asn Ser Glu Ser Ser Ser Thr Val Pro Ser Pro Pro
595 600 605

Asn Ser Pro Asn Ala Arg Ala Ala Val Val Phe Gly Ala Lys Lys Gln
610 615 620

Val Glu Lys Asn Asn Lys
625 630

<210> 114

<211> 1955

<212> DNA

<213> Haemophilus influenzae

<400> 114

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gacgatacct cgaatcaaag aacaaaatct aaattggaaa agttgtccat tccttcttta 180
ggaggaggga tgaagttagt tgtgcaaaat tttgctgggtg cttaaagaacc tagtttctta 240
aatgaaaatg actatatatc atatttttcc tcactttcta tgattaaaga tgatgttgaa 300
aataacaata aaaataagga tactccaatt ggctcaatag acgagcctag agcaccaaat 360
tcaaacgaaa atcatcaaaa tcatcatgga cagcaatatg tatattcggg tctttattat 420
attccatcgt ggcgtctaata aaattttacca aataagtttt attcagggtta ctatggatat 480
gcgtattact ttggcaagca aactgccact acattacctg taaatggcga agcaacgtat 540
aaaggaactt ggagcttcat caccgcaact gaaagaggca aaaattattc tttgttcaat 600
aatagagggtc aagcttattc tcgacgtagt gctactccag gagatattga tttagaaaaac 660
ggtgacgcag gcttaacaag tgaatttact gtcaattttg gtacaaaaaa gctcactgga 720
gaaccttatt ataataaag ggaaacaaat cttaatcaat caaaagatag aaaacataaa 780
ctctacgata tagaagctga tgtgtatagc aaccgattca gaggtacagt aaagccaacc 840
aaaaaagagt cttctgaaga acatcccttt accagcgagg gaacattaga aggtggtttt 900
tatgggccta atgctgaaga actaggggga aaatttttag ctacgataaa aaaagttttt 960
ggggtattta gtgccaaaga aacggaagaa aaaccaaata tacccaaaga aaccttaatt 1020
gatggcaagc taactacttt ctctaaaaca accgatacaa caaccaataa aacaaccagt 1080
gcaaaaacca atacagaaaa ctttacgaca aaagatatat caagttttgg tgaagctgat 1140
tatcttttaa ttgataatta ccctattccg cttttacctg agagtgggtga tttcataagt 1200
agtaagcacc atgaggtagg aggtaaacgc tataaagtgg aagcatgttg caagaatcta 1260
tgctatgtga aatttggtat gtattatgag gataaagaga acaacaaaaa tgaaacagac 1320
aaagaaaaag aaaaacaaac gacaacatct atcaagactt attatcaatt cttattaggt 1380
ctccggactc ccagttctga aattcctaaa atgggaaacg tgacatatcg cggtagttgg 1440
tttgggtata ttggtgatga caagacatct tactccgcta caggagataa acgacaagat 1500
aaaaatgctc ccgccgagtt taatgctgat tttaacaata aaaagctaac aggcacatca 1560
aaacgacacg ataatacaaa tcccgtgttt aacattaagg caacctttca aaatggtcgg 1620
aatgactttg aaggtagcag aaccgcagaa aattttgtaa tagatggtaa agatagtcaa 1680
ggaaataccc caattaatat tacaactaaa gtaaaccgggg catttttatgg acctgatgct 1740
tctgaattag gcggttattt cacctataac ggaaaagaca ctataactaa aaatactgaa 1800

agttcctcaa ccgtaccttc accaccaat tcaccaaagc caagagctgc agttgtgttt 1860
 ggagctaaaa aacaagtaga aacaaccaac aagtagaaaa aaacaaataa tggaatacta 1920
 aaaatgacta aaaaagcttc tagaaagccg aattc 1955

<210> 115
 <211> 631
 <212> PRT
 <213> Haemophilus influenzae

<400> 115

Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
 1 5 10 15

Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Thr
 20 25 30

Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Thr
 35 40 45

Lys Ser Lys Leu Glu Lys Leu Ser Ile Pro Ser Leu Gly Gly Gly Met
 50 55 60

Lys Leu Val Val Gln Asn Phe Ala Gly Ala Lys Glu Pro Ser Phe Leu
 65 70 75 80

Asn Glu Asn Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Met Ile Lys
 85 90 95

Asp Asp Val Glu Asn Asn Asn Lys Asn Lys Asp Thr Pro Ile Gly Ser
 100 105 110

Ile Asp Glu Pro Arg Ala Pro Asn Ser Asn Glu Asn His Gln Asn His
 115 120 125

His Gly Gln Gln Tyr Val Tyr Ser Gly Leu Tyr Tyr Ile Pro Ser Trp
 130 135 140

Arg Leu Ile Asn Leu Pro Asn Lys Phe Tyr Ser Gly Tyr Tyr Gly Tyr
 145 150 155 160

Ala Tyr Tyr Phe Gly Lys Gln Thr Ala Thr Thr Leu Pro Val Asn Gly
 165 170 175

Glu Ala Thr Tyr Lys Gly Thr Trp Ser Phe Ile Thr Ala Thr Glu Arg
 180 185 190

Gly Lys Asn Tyr Ser Leu Phe Asn Asn Arg Gly Gln Ala Tyr Ser Arg
 195 200 205

Arg Ser Ala Thr Pro Gly Asp Ile Asp Leu Glu Asn Gly Asp Ala Gly
 210 215 220

Leu Thr Ser Glu Phe Thr Val Asn Phe Gly Thr Lys Lys Leu Thr Gly
 225 230 235 240

Glu Pro Tyr Tyr Asn Glu Arg Glu Thr Asn Leu Asn Gln Ser Lys Asp
 245 250 255

Arg Lys His Lys Leu Tyr Asp Leu Glu Ala Asp Val Tyr Ser Asn Arg
 260 265 270
 Phe Arg Gly Thr Val Lys Pro Thr Lys Lys Glu Ser Ser Glu Glu His
 275 280 285
 Pro Phe Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn
 290 295 300
 Ala Glu Glu Leu Gly Gly Lys Phe Leu Ala Ser Asp Lys Lys Val Phe
 305 310 315 320
 Gly Val Phe Ser Ala Lys Glu Thr Glu Glu Lys Pro Lys Leu Pro Lys
 325 330 335
 Glu Thr Leu Ile Asp Gly Lys Leu Thr Thr Phe Ser Lys Thr Thr Asp
 340 345 350
 Thr Thr Thr Asn Lys Thr Thr Ser Ala Lys Thr Asn Thr Glu Asn Phe
 355 360 365
 Thr Thr Lys Asp Ile Pro Ser Phe Gly Glu Ala Asp Tyr Leu Leu Ile
 370 375 380
 Asp Asn Tyr Pro Ile Pro Leu Leu Pro Glu Ser Gly Asp Phe Ile Ser
 385 390 395 400
 Ser Lys His His Glu Val Gly Gly Lys Arg Tyr Lys Val Glu Ala Cys
 405 410 415
 Cys Lys Asn Leu Cys Tyr Val Lys Phe Gly Met Tyr Tyr Glu Asp Lys
 420 425 430
 Glu Asn Asn Lys Asn Glu Thr Asp Lys Glu Lys Glu Lys Gln Thr Thr
 435 440 445
 Thr Ser Ile Lys Thr Tyr Tyr Gln Phe Leu Leu Gly Leu Arg Thr Pro
 450 455 460
 Ser Ser Glu Ile Pro Lys Met Gly Asn Val Thr Tyr Arg Gly Ser Trp
 465 470 475 480
 Phe Gly Tyr Ile Gly Asp Asp Lys Thr Ser Tyr Ser Ala Thr Gly Asp
 485 490 495
 Lys Arg Gln Asp Lys Asn Ala Pro Ala Glu Phe Asn Ala Asp Phe Asn
 500 505 510
 Asn Lys Lys Leu Thr Gly Thr Ser Lys Arg His Asp Asn Gln Asn Pro
 515 520 525
 Val Phe Asn Ile Lys Ala Thr Phe Gln Asn Gly Arg Asn Asp Phe Glu
 530 535 540
 Gly Thr Ala Thr Ala Glu Asn Phe Val Ile Asp Gly Lys Asp Ser Gln
 545 550 555 560
 Gly Asn Thr Pro Ile Asn Ile Thr Thr Lys Val Asn Gly Ala Phe Tyr
 565 570 575

Gly Pro Asp Ala Ser Glu Leu Gly Gly Tyr Phe Thr Tyr Asn Gly Lys
580 585 590

Asp Thr Ile Thr Lys Asn Thr Glu Ser Ser Ser Thr Val Pro Ser Pro
595 600 605

Pro Asn Ser Pro Asn Ala Arg Ala Ala Val Val Phe Gly Ala Lys Lys
610 615 620

Gln Val Glu Thr Thr Asn Lys
625 630

<210> 116
<211> 100
<212> DNA
<213> Haemophilus influenzae

<400> 116
tctaacttga cattattaca aaaaaagatc aataatgcga attattatca attttgtatg 60
agtatataat tctatgaaat ctgtacctct tatctctggt 100

<210> 117
<211> 100
<212> DNA
<213> Haemophilus influenzae

<400> 117
tctaacttga cattattaca aaaaaagatc aataatgcga attattatca attttgtatg 60
agtatataat tctatgaaat ctgtacctct tatctctggt 100

<210> 118
<211> 99
<212> DNA
<213> Haemophilus influenzae

<400> 118
tctaagttga cattattaca aaaaaagaac aataatgcga attattatca attttgtata 60
agtattaatt ctatgaaatc tgtacctctt atctctggt 99

<210> 119
<211> 100
<212> DNA
<213> Haemophilus influenzae

<400> 119
tctaagttga cattattaca aaaaaagaac aataatgcga attattatca attttgtata 60
agaatataat tctatgaaat ctgtacctct tatctctggt 100

<210> 120
<211> 35
<212> DNA
<213> Haemophilus influenzae

<400> 120
ggatccatat gaaatctgta cctcttatct ctggt 35

<210> 121
<211> 61
<212> DNA
<213> Haemophilus influenzae

<400> 121
gtagaaacaa ccaaataatg gaatactaaa aatgactaaa aaaccctatt ttcgcctaag 60
t 61

<210> 122
<211> 61
<212> DNA
<213> Haemophilus influenzae

<400> 122
gtagaaacaa ccaaataatg gaatactaaa aatgactaaa aaaccctatt ttcgcctaag 60
t 61

<210> 123
<211> 61
<212> DNA
<213> Haemophilus influenzae

<400> 123
gtagaaacaa ccaagtaatg gaatactaaa aatgactaaa aaaccctatt ttcgcctaag 60
t 61

<210> 124
<211> 78
<212> DNA
<213> Haemophilus influenzae

<400> 124
gtagaaacaa ccaacaagta aaaacaacca agtaatggaa tactaaaaat gactaaaaaa 60
ccctattttt gcctaagt 78

<210> 125
<211> 43
<212> DNA
<213> Haemophilus influenzae

<400> 125
gtagaaacaa ccaaataatg gaatactaaa aatgactaaa aaa 43

<210> 126
<211> 60
<212> DNA
<213> Haemophilus influenzae

<400> 126

gtagaaacaa ccaacaagta aaaacaacca agtaatggaa tactaaaaat gactaaaaaa 60

<210> 127

<211> 60

<212> DNA

<213> Haemophilus influenzae

<400> 127

gtagaaaaaa acaactagta aaaacaacca agtaatggaa tactaaaaat gactaaaaaa 60

<210> 128

<211> 60

<212> DNA

<213> Haemophilus influenzae

<400> 128

gtagaaacaa ccaacaagta gaaaaaaaca aataatggaa tactaaaaat gactaaaaaa 60

<210> 129

<211> 35

<212> DNA

<213> Haemophilus influenzae

<400> 129

tctagaagct ttttttagtca ttttttagtat tccat

35

<210> 130

<211> 58

<212> DNA

<213> Haemophilus influenzae

<400> 130

tatgtgttct ggtggtggtt ctttcgacgt tgacaacggt tctaactct cctcttct 58

<210> 131

<211> 59

<212> DNA

<213> Haemophilus influenzae

<400> 131

acacaagacc accaccaaga aagctgcaac tggtgcaaag attgtgaggg agaagattt 59

<210> 132

<211> 9

<212> PRT

<213> Haemophilus influenzae

<400> 132

Asn Pro Ala Ser Thr Thr Asn Lys Asp

1

5

<210> 133

<211> 17
 <212> PRT
 <213> Haemophilus influenzae

<400> 133
 Asn Pro Ala Ser Thr Thr Ser Leu Glu Gly Gly Phe Tyr Gly Pro Lys
 1 5 10 15

Asp

<210> 134
 <211> 16
 <212> PRT
 <213> Haemophilus influenzae

<400> 134
 Asn Pro Ala Ser Thr Thr Ser Leu Glu Gly Gly Phe Tyr Gly Lys Asp
 1 5 10 15

<210> 135
 <211> 16
 <212> PRT
 <213> Haemophilus influenzae

<400> 135
 Asn Pro Ala Ser Thr Thr Leu Glu Gly Gly Phe Tyr Gly Pro Lys Asp
 1 5 10 15

<210> 136
 <211> 15
 <212> PRT
 <213> Haemophilus influenzae

<400> 136
 Asn Pro Ala Ser Thr Thr Leu Glu Gly Gly Phe Tyr Gly Lys Asp
 1 5 10 15

<210> 137
 <211> 35
 <212> DNA
 <213> Haemophilus influenzae

<400> 137
 tctagaagct ttttttagtca ttttttagtat tccat

35

<210> 138
 <211> 4
 <212> PRT
 <213> Haemophilus influenzae

<400> 138
 Met Thr Lys Lys
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<210> 139
 <211> 5
 <212> PRT
 <213> Haemophilus influenzae

<400> 139
 Glu Gln Val Leu Asn
 1 5

<210> 140
 <211> 9
 <212> PRT
 <213> Haemophilus influenzae

<400> 140
 Asp Ile Arg Asp Leu Thr Arg Tyr Asp
 1 5

<210> 141
 <211> 18
 <212> PRT
 <213> Haemophilus influenzae

<400> 141
 Gly Ala Ile Asn Glu Ile Glu Tyr Glu Asn Val Lys Ala Val Glu Ile
 1 5 10 15

Ser Lys

<210> 142
 <211> 5
 <212> PRT
 <213> Haemophilus influenzae

<400> 142
 Val Tyr Asn Leu Phe
 1 5

<210> 143
 <211> 9
 <212> PRT
 <213> Haemophilus influenzae

<400> 143
 Leu Asn Tyr Arg Tyr Val Thr Trp Glu
 1 5

<210> 144
 <211> 9
 <212> PRT
 <213> Haemophilus influenzae

<400> 144

Cys Ser Gly Gly Gly Ser Phe Asp
1 5

<210> 145

<211> 9

<212> PRT

<213> Haemophilus influenzae

<400> 145

Cys Leu Gly Gly Gly Ser Phe Asp
1 5

<210> 146

<211> 8

<212> PRT

<213> Haemophilus influenzae

<400> 146

Leu Ser Gly Gly Phe Phe Gly Pro
1 5

<210> 147

<211> 10

<212> PRT

<213> Haemophilus influenzae

<400> 147

Met Lys Ser Val Pro Leu Ile Ser Gly Ser
1 5 10

<210> 148

<211> 647

<212> PRT

<213> Haemophilus influenzae

<400> 148

Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
1 5 10 15Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Thr
20 25 30Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Lys
35 40 45Lys Ser Asn Leu Lys Lys Leu Phe Ile Pro Ser Leu Gly Gly Gly Met
50 55 60Lys Leu Val Ala Gln Asn Leu Arg Gly Asn Lys Glu Pro Ser Phe Leu
65 70 75 80Asn Glu Asp Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Thr Ile Glu
85 90 95

Lys Asp Val Lys Asp Asn Asn Lys Asn Gly Ala Asp Leu Ile Gly Ser
 100 105 110
 Ile Asp Glu Pro Ser Thr Thr Asn Pro Pro Glu Lys His His Gly Gln
 115 120 125
 Lys Tyr Val Tyr Ser Gly Leu Tyr Tyr Thr Pro Ser Trp Ser Leu Asn
 130 135 140
 Asp Ser Lys Asn Lys Phe Tyr Leu Gly Tyr Tyr Gly Tyr Ala Phe Tyr
 145 150 155 160
 Tyr Gly Asn Lys Thr Ala Thr Asn Leu Pro Val Asn Gly Val Ala Lys
 165 170 175
 Tyr Lys Gly Thr Trp Asp Phe Ile Thr Ala Thr Lys Asn Gly Lys Arg
 180 185 190
 Tyr Pro Leu Leu Ser Asn Gly Ser His Ala Tyr Tyr Arg Arg Ser Ala
 195 200 205
 Ile Pro Glu Asp Ile Asp Leu Glu Asn Asp Ser Lys Asn Gly Asp Ile
 210 215 220
 Gly Leu Ile Ser Glu Phe Ser Ala Asp Phe Gly Thr Lys Lys Leu Thr
 225 230 235 240
 Gly Gln Leu Ser Tyr Thr Lys Arg Lys Thr Asn Asn Gln Pro Tyr Glu
 245 250 255
 Lys Lys Lys Leu Tyr Asp Ile Asp Ala Asp Ile Tyr Ser Asn Arg Phe
 260 265 270
 Arg Gly Thr Val Lys Pro Thr Glu Lys Asp Ser Glu Glu His Pro Phe
 275 280 285
 Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn Ala Glu
 290 295 300
 Glu Leu Gly Gly Lys Phe Leu Ala Thr Asp Asn Arg Val Phe Gly Val
 305 310 315 320
 Phe Ser Ala Lys Glu Thr Glu Glu Thr Lys Lys Glu Ala Leu Ser Lys
 325 330 335
 Glu Thr Leu Ile Asp Gly Lys Leu Ile Thr Phe Ser Thr Lys Lys Thr
 340 345 350
 Asp Ala Lys Thr Asn Ala Thr Thr Ser Thr Ala Ala Asn Thr Thr Thr
 355 360 365
 Asp Thr Thr Ala Asn Thr Ile Thr Asp Glu Lys Asn Phe Lys Thr Glu
 370 375 380
 Asp Ile Ser Ser Phe Gly Glu Ala Asp Tyr Leu Leu Ile Asp Lys Tyr
 385 390 395 400
 Pro Ile Pro Leu Leu Pro Asp Lys Asn Thr Asn Asp Phe Ile Ser Ser

Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Lys
 35 40 45
 Lys Ser Asn Leu Lys Lys Leu Phe Ile Pro Ser Leu Gly Gly Gly Met
 50 55 60
 Lys Leu Val Ala Gln Asn Leu Arg Gly Asn Lys Glu Pro Ser Phe Leu
 65 70 75 80
 Asn Glu Asp Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Thr Ile Glu
 85 90 95
 Lys Asp Val Lys Asp Asn Asn Lys Asn Gly Ala Asp Leu Ile Gly Ser
 100 105 110
 Ile Asp Glu Pro Ser Thr Thr Asn Pro Pro Glu Lys His His Gly Gln
 115 120 125
 Lys Tyr Val Tyr Ser Gly Leu Tyr Tyr Thr Pro Ser Trp Ser Leu Asn
 130 135 140
 Asp Ser Lys Asn Lys Phe Tyr Leu Gly Tyr Tyr Gly Tyr Ala Phe Tyr
 145 150 155 160
 Tyr Gly Asn Lys Thr Ala Thr Asn Leu Pro Val Asn Gly Val Ala Lys
 165 170 175
 Tyr Lys Gly Thr Trp Asp Phe Ile Thr Ala Thr Lys Asn Gly Lys Arg
 180 185 190
 Tyr Pro Leu Leu Ser Asn Gly Ser His Ala Tyr Tyr Arg Arg Ser Ala
 195 200 205
 Ile Pro Glu Asp Ile Asp Leu Glu Asn Asp Ser Lys Asn Gly Asp Ile
 210 215 220
 Gly Leu Ile Ser Glu Phe Ser Ala Asp Phe Gly Thr Lys Lys Leu Thr
 225 230 235 240
 Gly Gln Leu Ser Tyr Thr Lys Arg Lys Thr Asn Asn Gln Pro Tyr Glu
 245 250 255
 Lys Lys Lys Leu Tyr Asp Ile Asp Ala Asp Ile Tyr Ser Asn Arg Phe
 260 265 270
 Arg Gly Thr Val Lys Pro Thr Glu Lys Asp Ser Glu Glu His Pro Phe
 275 280 285
 Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn Ala Glu
 290 295 300
 Glu Leu Gly Gly Lys Phe Leu Ala Thr Asp Asn Arg Val Phe Gly Val
 305 310 315 320
 Phe Ser Ala Lys Glu Thr Glu Glu Thr Lys Lys Glu Ala Leu Ser Lys
 325 330 335
 Glu Thr Leu Ile Asp Gly Lys Leu Ile Thr Phe Ser Thr Lys Lys Thr

A handwritten signature in black ink, appearing to be "S".

<400> 150

Met	Lys	Ser	Val	Pro	Leu	Ile	Ser	Gly	Gly	Leu	Ser	Phe	Leu	Leu	Ser
1				5					10					15	
Ala	Cys	Ser	Gly	Gly	Gly	Ser	Phe	Asp	Val	Asp	Asn	Val	Ser	Asn	Thr
			20					25					30		
Pro	Ser	Ser	Lys	Pro	Arg	Tyr	Gln	Asp	Asp	Thr	Ser	Asn	Gln	Arg	Lys
		35					40					45			
Lys	Ser	Asn	Leu	Lys	Lys	Leu	Phe	Ile	Pro	Ser	Leu	Gly	Gly	Gly	Met
	50					55					60				

Lys Leu Val Ala Gln Asn Leu Arg Gly Asn Lys Glu Pro Ser Phe Leu
 65 70 75 80
 Asn Glu Asp Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Thr Ile Glu
 85 90 95
 Lys Asp Val Lys Asp Asn Asn Lys Asn Gly Ala Asp Leu Ile Gly Ser
 100 105 110
 Ile Asp Glu Pro Ser Thr Thr Asn Pro Pro Glu Lys His His Gly Gln
 115 120 125
 Lys Tyr Val Tyr Ser Gly Leu Tyr Tyr Thr Pro Ser Trp Ser Leu Asn
 130 135 140
 Asp Ser Lys Asn Lys Phe Tyr Leu Gly Tyr Tyr Gly Tyr Ala Phe Tyr
 145 150 155 160
 Tyr Gly Asn Lys Thr Ala Thr Asn Leu Pro Val Asn Gly Val Ala Lys
 165 170 175
 Tyr Lys Gly Thr Trp Asp Phe Ile Thr Ala Thr Lys Asn Gly Lys Arg
 180 185 190
 Tyr Pro Leu Leu Ser Asn Gly Ser His Ala Tyr Tyr Arg Arg Ser Ala
 195 200 205
 Ile Pro Glu Asp Ile Asp Leu Glu Asn Asp Ser Lys Asn Gly Asp Ile
 210 215 220
 Gly Leu Ile Ser Glu Phe Ser Ala Asp Phe Gly Thr Lys Lys Leu Thr
 225 230 235 240
 Gly Gln Leu Ser Tyr Thr Lys Arg Lys Thr Asn Asn Gln Pro Tyr Glu
 245 250 255
 Lys Lys Lys Leu Tyr Asp Ile Asp Ala Asp Ile Tyr Ser Asn Arg Phe
 260 265 270
 Arg Gly Thr Val Lys Pro Thr Glu Lys Asp Ser Glu Glu His Pro Phe
 275 280 285
 Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn Ala Glu
 290 295 300
 Glu Leu Gly Gly Lys Phe Leu Ala Thr Asp Asn Arg Val Phe Gly Val
 305 310 315 320
 Phe Ser Ala Lys Glu Thr Glu Glu Thr Lys Lys Glu Ala Leu Ser Lys
 325 330 335
 Glu Thr Leu Ile Asp Gly Lys Leu Ile Thr Phe Ser Thr Lys Lys Thr
 340 345 350
 Asp Ala Lys Thr Asn Ala Thr Thr Ser Thr Ala Ala Asn Thr Thr Thr
 355 360 365
 Asp Thr Thr Ala Asn Thr Ile Thr Asp Glu Lys Asn Phe Lys Thr Glu

370 375 380
 Asp Ile Ser Ser Phe Gly Glu Ala Asp Tyr Leu Leu Ile Asp Lys Tyr
 385 390 395 400
 Pro Ile Pro Leu Leu Pro Asp Lys Asn Thr Asn Asp Phe Ile Ser Ser
 405 410 415
 Lys His His Thr Val Gly Asn Lys Arg Tyr Lys Val Glu Ala Cys Cys
 420 425 430
 Ser Asn Leu Ser Tyr Val Lys Phe Gly Met Tyr Tyr Glu Asp Pro Leu
 435 440 445
 Lys Glu Lys Glu Thr Glu Thr Glu Thr Glu Lys Asp Lys Glu
 450 455 460
 Lys Glu Lys Glu Lys Asp Lys Asp Lys Glu Lys Gln Thr Ala Ala Thr
 465 470 475 480
 Thr Asn Thr Tyr Tyr Gln Phe Leu Leu Gly His Arg Thr Pro Lys Asp
 485 490 495
 Asp Ile Pro Lys Thr Gly Ser Ala Lys Tyr His Gly Ser Trp Phe Gly
 500 505 510
 Tyr Ile Thr Asp Gly Lys Thr Ser Tyr Ser Pro Ser Gly Asp Lys Lys
 515 520 525

Arg

<210> 151
 <211> 463
 <212> PRT
 <213> Haemophilus influenzae

<400> 151
 Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
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 Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Thr
 20 25 30
 Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Lys
 35 40 45
 Lys Ser Asn Leu Lys Lys Leu Phe Ile Pro Ser Leu Gly Gly Gly Met
 50 55 60
 Lys Leu Val Ala Gln Asn Leu Arg Gly Asn Lys Glu Pro Ser Phe Leu
 65 70 75 80
 Asn Glu Asp Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Thr Ile Glu
 85 90 95
 Lys Asp Val Lys Asp Asn Asn Lys Asn Gly Ala Asp Leu Ile Gly Ser
 100 105 110

Ile Asp Glu Pro Ser Thr Thr Asn Pro Pro Glu Lys His His Gly Gln
 115 120 125
 Lys Tyr Val Tyr Ser Gly Leu Tyr Tyr Thr Pro Ser Trp Ser Leu Asn
 130 135 140
 Asp Ser Lys Asn Lys Phe Tyr Leu Gly Tyr Tyr Gly Tyr Ala Phe Tyr
 145 150 155 160
 Tyr Gly Asn Lys Thr Ala Thr Asn Leu Pro Val Asn Gly Val Ala Lys
 165 170 175
 Tyr Lys Gly Thr Trp Asp Phe Ile Thr Ala Thr Lys Asn Gly Lys Arg
 180 185 190
 Tyr Pro Leu Leu Ser Asn Gly Ser His Ala Tyr Tyr Arg Arg Ser Ala
 195 200 205
 Ile Pro Glu Asp Ile Asp Leu Glu Asn Asp Ser Lys Asn Gly Asp Ile
 210 215 220
 Gly Leu Ile Ser Glu Phe Ser Ala Asp Phe Gly Thr Lys Lys Leu Thr
 225 230 235 240
 Gly Gln Leu Ser Tyr Thr Lys Arg Lys Thr Asn Asn Gln Pro Tyr Glu
 245 250 255
 Lys Lys Lys Leu Tyr Asp Ile Asp Ala Asp Ile Tyr Ser Asn Arg Phe
 260 265 270
 Arg Gly Thr Val Lys Pro Thr Glu Lys Asp Ser Glu Glu His Pro Phe
 275 280 285
 Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn Ala Glu
 290 295 300
 Glu Leu Gly Gly Lys Phe Leu Ala Thr Asp Asn Arg Val Phe Gly Val
 305 310 315 320
 Phe Ser Ala Lys Glu Thr Glu Glu Thr Lys Lys Glu Ala Leu Ser Lys
 325 330 335
 Glu Thr Leu Ile Asp Gly Lys Leu Ile Thr Phe Ser Thr Lys Lys Thr
 340 345 350
 Asp Ala Lys Thr Asn Ala Thr Thr Ser Thr Ala Ala Asn Thr Thr Thr
 355 360 365
 Asp Thr Thr Ala Asn Thr Ile Thr Asp Glu Lys Asn Phe Lys Thr Glu
 370 375 380
 Asp Ile Ser Ser Phe Gly Glu Ala Asp Tyr Leu Leu Ile Asp Lys Tyr
 385 390 395 400
 Pro Ile Pro Leu Leu Pro Asp Lys Asn Thr Asn Asp Phe Ile Ser Ser
 405 410 415
 Lys His His Thr Val Gly Asn Lys Arg Tyr Lys Val Glu Ala Cys Cys

Gly Gln Leu Ser Tyr Thr Lys Arg Lys Thr Asn Asn Gln Pro Tyr Glu
 245 250 255
 Lys Lys Lys Leu Tyr Asp Ile Asp Ala Asp Ile Tyr Ser Asn Arg Phe
 260 265 270
 Arg Gly Thr Val Lys Pro Thr Glu Lys Asp Ser Glu Glu His Pro Phe
 275 280 285
 Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn Ala Glu
 290 295 300
 Glu Leu Gly Gly Lys Phe Leu Ala Thr Asp Asn Arg Val Phe Gly Val
 305 310 315 320
 Phe Ser Ala Lys Glu Thr Glu Glu Thr Lys Lys Glu Ala Leu Ser Lys
 325 330 335
 Glu Thr Leu Ile Asp Gly Lys Leu Ile Thr Phe Ser Thr Lys Lys Thr
 340 345 350
 Asp Ala Lys Thr Asn Ala Thr Thr Ser Thr Ala Ala Asn Thr Thr Thr
 355 360 365
 Asp Thr Thr Ala Asn Thr Ile Thr Asp Glu Lys Asn Phe Lys Thr Glu
 370 375 380
 Asp Ile Ser Ser Phe Gly Glu Ala Asp Tyr Leu Leu Ile Asp Lys Tyr
 385 390 395 400
 Pro Ile Pro Leu Leu Pro Asp Lys Asn Thr Asn Asp Phe Ile Ser Ser
 405 410 415
 Lys His His Thr Val Gly Asn Lys Arg Tyr Lys Val Glu Ala
 420 425 430

<210> 153
 <211> 417
 <212> PRT
 <213> Haemophilus influenzae

<400> 153
 Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
 1 5 10 15
 Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Thr
 20 25 30
 Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Lys
 35 40 45
 Lys Ser Asn Leu Lys Lys Leu Phe Ile Pro Ser Leu Gly Gly Gly Met
 50 55 60
 Lys Leu Val Ala Gln Asn Leu Arg Gly Asn Lys Glu Pro Ser Phe Leu
 65 70 75 80

Asn Glu Asp Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Thr Ile Glu
 85 90 95
 Lys Asp Val Lys Asp Asn Asn Lys Asn Gly Ala Asp Leu Ile Gly Ser
 100 105 110
 Ile Asp Glu Pro Ser Thr Thr Asn Pro Pro Glu Lys His His Gly Gln
 115 120 125
 Lys Tyr Val Tyr Ser Gly Leu Tyr Tyr Thr Pro Ser Trp Ser Leu Asn
 130 135 140
 Asp Ser Lys Asn Lys Phe Tyr Leu Gly Tyr Tyr Gly Tyr Ala Phe Tyr
 145 150 155 160
 Tyr Gly Asn Lys Thr Ala Thr Asn Leu Pro Val Asn Gly Val Ala Lys
 165 170 175
 Tyr Lys Gly Thr Trp Asp Phe Ile Thr Ala Thr Lys Asn Gly Lys Arg
 180 185 190
 Tyr Pro Leu Leu Ser Asn Gly Ser His Ala Tyr Tyr Arg Arg Ser Ala
 195 200 205
 Ile Pro Glu Asp Ile Asp Leu Glu Asn Asp Ser Lys Asn Gly Asp Ile
 210 215 220
 Gly Leu Ile Ser Glu Phe Ser Ala Asp Phe Gly Thr Lys Lys Leu Thr
 225 230 235 240
 Gly Gln Leu Ser Tyr Thr Lys Arg Lys Thr Asn Asn Gln Pro Tyr Glu
 245 250 255
 Lys Lys Lys Leu Tyr Asp Ile Asp Ala Asp Ile Tyr Ser Asn Arg Phe
 260 265 270
 Arg Gly Thr Val Lys Pro Thr Glu Lys Asp Ser Glu Glu His Pro Phe
 275 280 285
 Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn Ala Glu
 290 295 300
 Glu Leu Gly Gly Lys Phe Leu Ala Thr Asp Asn Arg Val Phe Gly Val
 305 310 315 320
 Phe Ser Ala Lys Glu Thr Glu Glu Thr Lys Lys Glu Ala Leu Ser Lys
 325 330 335
 Glu Thr Leu Ile Asp Gly Lys Leu Ile Thr Phe Ser Thr Lys Lys Thr
 340 345 350
 Asp Ala Lys Thr Asn Ala Thr Thr Ser Thr Ala Ala Asn Thr Thr Thr
 355 360 365
 Asp Thr Thr Ala Asn Thr Ile Thr Asp Glu Lys Asn Phe Lys Thr Glu
 370 375 380
 Asp Ile Ser Ser Phe Gly Glu Ala Asp Tyr Leu Leu Ile Asp Lys Tyr
 385 390 395 400

Pro Ile Pro Leu Leu Pro Asp Lys Asn Thr Asn Asp Phe Ile Ser Ser
 405 410 415

Lys

<210> 154

<211> 411

<212> PRT

<213> Haemophilus influenzae

<400> 154

Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
 1 5 10 15

Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Thr
 20 25 30

Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Lys
 35 40 45

Lys Ser Asn Leu Lys Lys Leu Phe Ile Pro Ser Leu Gly Gly Gly Met
 50 55 60

Lys Leu Val Ala Gln Asn Leu Arg Gly Asn Lys Glu Pro Ser Phe Leu
 65 70 75 80

Asn Glu Asp Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Thr Ile Glu
 85 90 95

Lys Asp Val Lys Asp Asn Asn Lys Asn Gly Ala Asp Leu Ile Gly Ser
 100 105 110

Ile Asp Glu Pro Ser Thr Thr Asn Pro Pro Glu Lys His His Gly Gln
 115 120 125

Lys Tyr Val Tyr Ser Gly Leu Tyr Tyr Thr Pro Ser Trp Ser Leu Asn
 130 135 140

Asp Ser Lys Asn Lys Phe Tyr Leu Gly Tyr Tyr Gly Tyr Ala Phe Tyr
 145 150 155 160

Tyr Gly Asn Lys Thr Ala Thr Asn Leu Pro Val Asn Gly Val Ala Lys
 165 170 175

Tyr Lys Gly Thr Trp Asp Phe Ile Thr Ala Thr Lys Asn Gly Lys Arg
 180 185 190

Tyr Pro Leu Leu Ser Asn Gly Ser His-Ala Tyr Tyr Arg Arg Ser Ala
 195 200 205

Ile Pro Glu Asp Ile Asp Leu Glu Asn Asp Ser Lys Asn Gly Asp Ile
 210 215 220

Gly Leu Ile Ser Glu Phe Ser Ala Asp Phe Gly Thr Lys Lys Leu Thr
 225 230 235 240

Gly Gln Leu Ser Tyr Thr Lys Arg Lys Thr Asn Asn Gln Pro Tyr Glu
 245 250 255
 Lys Lys Lys Leu Tyr Asp Ile Asp Ala Asp Ile Tyr Ser Asn Arg Phe
 260 265 270
 Arg Gly Thr Val Lys Pro Thr Glu Lys Asp Ser Glu Glu His Pro Phe
 275 280 285
 Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn Ala Glu
 290 295 300
 Glu Leu Gly Gly Lys Phe Leu Ala Thr Asp Asn Arg Val Phe Gly Val
 305 310 315 320
 Phe Ser Ala Lys Glu Thr Glu Glu Thr Lys Lys Glu Ala Leu Ser Lys
 325 330 335
 Glu Thr Leu Ile Asp Gly Lys Leu Ile Thr Phe Ser Thr Lys Lys Thr
 340 345 350
 Asp Ala Lys Thr Asn Ala Thr Thr Ser Thr Ala Ala Asn Thr Thr Thr
 355 360 365
 Asp Thr Thr Ala Asn Thr Ile Thr Asp Glu Lys Asn Phe Lys Thr Glu
 370 375 380
 Asp Ile Ser Ser Phe Gly Glu Ala Asp Tyr Leu Leu Ile Asp Lys Tyr
 385 390 395 400
 Pro Ile Pro Leu Leu Pro Asp Lys Asn Thr Asn
 405 410

<210> 155
 <211> 404
 <212> PRT
 <213> Haemophilus influenzae

<400> 155
 Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
 1 5 10 15
 Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Thr
 20 25 30
 Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Lys
 35 40 45
 Lys Ser Asn Leu Lys Lys Leu Phe Ile Pro Ser Leu Gly Gly Gly Met
 50 55 60
 Lys Leu Val Ala Gln Asn Leu Arg Gly Asn Lys Glu Pro Ser Phe Leu
 65 70 75 80
 Asn Glu Asp Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Thr Ile Glu
 85 90 95
 Lys Asp Val Lys Asp Asn Asn Lys Asn Gly Ala Asp Leu Ile Gly Ser

[illegible]

<210> 156
 <211> 365
 <212> PRT
 <213> Haemophilus influenzae

<400> 156

Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
 1 5 10 15

Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Thr
 20 25 30

Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Lys
 35 40 45

Lys Ser Asn Leu Lys Lys Leu Phe Ile Pro Ser Leu Gly Gly Gly Met
 50 55 60

Lys Leu Val Ala Gln Asn Leu Arg Gly Asn Lys Glu Pro Ser Phe Leu
 65 70 75 80

Asn Glu Asp Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Thr Ile Glu
 85 90 95

Lys Asp Val Lys Asp Asn Asn Lys Asn Gly Ala Asp Leu Ile Gly Ser
 100 105 110

Ile Asp Glu Pro Ser Thr Thr Asn Pro Pro Glu Lys His His Gly Gln
 115 120 125

Lys Tyr Val Tyr Ser Gly Leu Tyr Tyr Thr Pro Ser Trp Ser Leu Asn
 130 135 140

Asp Ser Lys Asn Lys Phe Tyr Leu Gly Tyr Tyr Gly Tyr Ala Phe Tyr
 145 150 155 160

Tyr Gly Asn Lys Thr Ala Thr Asn Leu Pro Val Asn Gly Val Ala Lys
 165 170 175

Tyr Lys Gly Thr Trp Asp Phe Ile Thr Ala Thr Lys Asn Gly Lys Arg
 180 185 190

Tyr Pro Leu Leu Ser Asn Gly Ser His Ala Tyr Tyr Arg Arg Ser Ala
 195 200 205

Ile Pro Glu Asp Ile Asp Leu Glu Asn Asp Ser Lys Asn Gly Asp Ile
 210 215 220

Gly Leu Ile Ser Glu Phe Ser Ala Asp Phe Gly Thr Lys Lys Leu Thr
 225 230 235 240

Gly Gln Leu Ser Tyr Thr Lys Arg Lys Thr Asn Asn Gln Pro Tyr Glu
 245 250 255


Lys Lys Lys Leu Tyr Asp Ile Asp Ala Asp Ile Tyr Ser Asn Arg Phe
 260 265 270

Arg Gly Thr Val Lys Pro Thr Glu Lys Asp Ser Glu Glu His Pro Phe

275	280	285
Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn Ala Glu		
290	295	300
Glu Leu Gly Gly Lys Phe Leu Ala Thr Asp Asn Arg Val Phe Gly Val		
305	310	315
Phe Ser Ala Lys Glu Thr Glu Glu Thr Lys Lys Glu Ala Leu Ser Lys		
325	330	335
Glu Thr Leu Ile Asp Gly Lys Leu Ile Thr Phe Ser Thr Lys Lys Thr		
340	345	350
Asp Ala Lys Thr Asn Ala Thr Thr Ser Thr Ala Ala Asn		
355	360	365

<210> 157
 <211> 310
 <212> PRT
 <213> Haemophilus influenzae

<400> 157



Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser		
1	5	10
Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Thr		
20	25	30
Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Lys		
35	40	45
Lys Ser Asn Leu Lys Lys Leu Phe Ile Pro Ser Leu Gly Gly Gly Met		
50	55	60
Lys Leu Val Ala Gln Asn Leu Arg Gly Asn Lys Glu Pro Ser Phe Leu		
65	70	75
Asn Glu Asp Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Thr Ile Glu		
85	90	95
Lys Asp Val Lys Asp Asn Asn Lys Asn Gly Ala Asp Leu Ile Gly Ser		
100	105	110
Ile Asp Glu Pro Ser Thr Thr Asn Pro Pro Glu Lys His His Gly Gln		
115	120	125
Lys Tyr Val Tyr Ser Gly Leu Tyr Tyr Thr Pro Ser Trp Ser Leu Asn		
130	135	140
Asp Ser Lys Asn Lys Phe Tyr Leu Gly Tyr Tyr Gly Tyr Ala Phe Tyr		
145	150	155
Tyr Gly Asn Lys Thr Ala Thr Asn Leu Pro Val Asn Gly Val Ala Lys		
165	170	175
Tyr Lys Gly Thr Trp Asp Phe Ile Thr Ala Thr Lys Asn Gly Lys Arg		
180	185	190

Tyr Pro Leu Leu Ser Asn Gly Ser His Ala Tyr Tyr Arg Arg Ser Ala
195 200 205

Ile Pro Glu Asp Ile Asp Leu Glu Asn Asp Ser Lys Asn Gly Asp Ile
210 215 220

Gly Leu Ile Ser Glu Phe Ser Ala Asp Phe Gly Thr Lys Lys Leu Thr
225 230 235 240

Gly Gln Leu Ser Tyr Thr Lys Arg Lys Thr Asn Asn Gln Pro Tyr Glu
245 250 255

Lys Lys Lys Leu Tyr Asp Ile Asp Ala Asp Ile Tyr Ser Asn Arg Phe
260 265 270

Arg Gly Thr Val Lys Pro Thr Glu Lys Asp Ser Glu Glu His Pro Phe
275 280 285

Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Asn Ala Glu
290 295 300

Glu Leu Gly Gly Lys Phe
305 310

<210> 158

<211> 265

<212> PRT

<213> Haemophilus influenzae

<400> 158

Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
1 5 10 15

Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Thr
20 25 30

Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Lys
35 40 45

Lys Ser Asn Leu Lys Lys Leu Phe Ile Pro Ser Leu Gly Gly Gly Met
50 55 60

Lys Leu Val Ala Gln Asn Leu Arg Gly Asn Lys Glu Pro Ser Phe Leu
65 70 75 80

Asn Glu Asp Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Thr Ile Glu
85 90 95

Lys Asp Val Lys Asp Asn Asn Lys Asn Gly Ala Asp Leu Ile Gly Ser
100 105 110

Ile Asp Glu Pro Ser Thr Thr Asn Pro Pro Glu Lys His His Gly Gln
115 120 125

Lys Tyr Val Tyr Ser Gly Leu Tyr Tyr Thr Pro Ser Trp Ser Leu Asn
130 135 140

B

Asp Ser Lys Asn Lys Phe Tyr Leu Gly Tyr Tyr Gly Tyr Ala Phe Tyr
145 150 155 160

Tyr Gly Asn Lys Thr Ala Thr Asn Leu Pro Val Asn Gly Val Ala Lys
165 170 175

Tyr Lys Gly Thr Trp Asp Phe Ile Thr Ala Thr Lys Asn Gly Lys Arg
180 185 190

Tyr Pro Leu Leu Ser Asn Gly Ser His Ala Tyr Tyr Arg Arg Ser Ala
195 200 205

Ile Pro Glu Asp Ile Asp Leu Glu Asn Asp Ser Lys Asn Gly Asp Ile
210 215 220

Gly Leu Ile Ser Glu Phe Ser Ala Asp Phe Gly Thr Lys Lys Leu Thr
225 230 235 240

Gly Gln Leu Ser Tyr Thr Lys Arg Lys Thr Asn Asn Gln Pro Tyr Glu
245 250 255

Lys Lys Lys Leu Tyr Asp Ile Asp Ala
260 265

<210> 159

<211> 123

<212> PRT

<213> Haemophilus influenzae

<400> 159

Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
1 5 10 15

Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Thr
20 25 30

Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Lys
35 40 45

Lys Ser Asn Leu Lys Lys Leu Phe Ile Pro Ser Leu Gly Gly Gly Met
50 55 60

Lys Leu Val Ala Gln Asn Leu Arg Gly Asn Lys Glu Pro Ser Phe Leu
65 70 75 80

Asn Glu Asp Asp Tyr Ile Ser Tyr Phe Ser Ser Leu Ser Thr Ile Glu
85 90 95

Lys Asp Val Lys Asp Asn Asn Lys Asn Gly Ala Asp Leu Ile Gly Ser
100 105 110

Ile Asp Glu Pro Ser Thr Thr Asn Pro Pro Glu
115 120

<210> 160

<211> 82

<212> PRT

<213> Haemophilus influenzae

<400> 160

Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu Leu Ser
1 5 10 15

Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser Asn Thr
20 25 30

Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Asn Gln Arg Lys
35 40 45

Lys Ser Asn Leu Lys Lys Leu Phe Ile Pro Ser Leu Gly Gly Gly Met
50 55 60

Lys Leu Val Ala Gln Asn Leu Arg Gly Asn Lys Glu Pro Ser Phe Leu
65 70 75 80

Asn Glu

